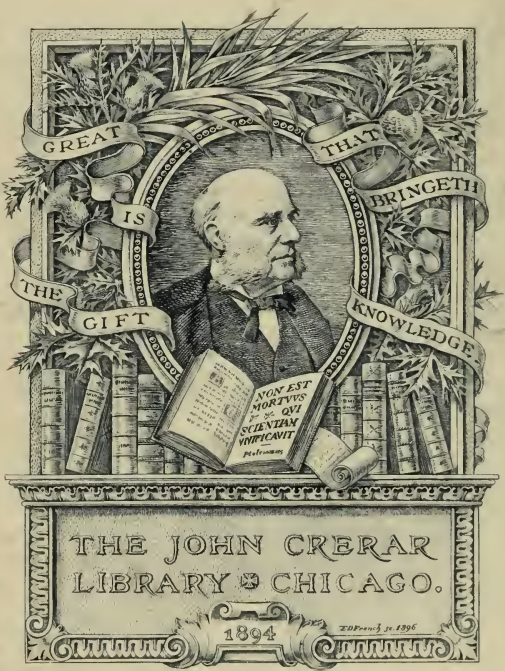
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Massachusetts

Register and Eighteenth Official Announcement

1906

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*Deceased, November 16, 1905.

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CLARK UNIVERSITY

WORCESTER, MASS.

REGISTER

AND

Eighteenth Official Announcement

WORCESTER, MASS.
PUBLISHED FOR THE UNIVERSITY
February, 1906

A C H.

CALENDAR, 1906-1907.

1906.

April 2.	Monday,	Spring Recess.
April 7.	Saturday,	
April 19.	Thursday,	Patriots' Day.
May 30.	Wednesday,	Memorial Day.
June 21.	Thursday,	Seventeenth academic year closes.

Summer Vacation of 14 Weeks.

Sept. 27.	Thursday,	Eighteenth academic year begins.
Nov. 29.	Thursday,	Thanksgiving Day.
Dec. 24.	Monday,	Christmas Recess.
1907.		
Jan. 2.	Wednesday,	
Feb. 1.	Friday,	Founder's Day.*
Feb. 22.	Friday,	Washington's Birthday.
April 1.	Monday,	Spring Recess.
April 6.	Saturday,	
April 19.	Friday,	Patriots' Day.
May 30.	Thursday,	Memorial Day.
June 20.	Thursday,	Eighteenth academic year closes.

*Not a holiday.

MEMBERS.

STAFF.

G. STANLEY HALL, PH. D., LL. D., 94 Woodland St.
President of the University, Professor of Psychology, and Curator of the Art Collection.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D., 17 Hammond St.
Professor of Mathematics.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876–89. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D., 24 Richards St.
Professor of Experimental and Comparative Psychology.

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900.

ARTHUR G. WEBSTER, PH. D., D. Sc., 66 West St.
Professor of Physics.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1885-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences.

HENRY TABER,* PH. D., 65 West St.
Professor of Mathematics.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D., 96 Woodland St.
Professor of Statistics and Social Economics.

President, Collegiate Department, 1902-.

* On leave of absence, 1905-06.

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CLIFTON F. HODGE, PH. D., 3 Charlotte St.
Assistant Professor of Physiology and Neurology.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology, and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

WILLIAM H. BURNHAM, PH. D., 100 Chatham St.
Assistant Professor of Pedagogy.

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900.

ALEXANDER F. CHAMBERLAIN, PH. D., 12 Shirley St.
Assistant Professor of Anthropology.

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian;* Editor, *Journal of American Folk-Lore;* Corresponding Member, O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society.

JOSEPH DE PEROTT, 5 Gates St.
Lecturer in Mathematics.

Student, Universities of Paris and Berlin, 1877-80.

SAMUEL P. CAPEN, PH. D., 940 Main St.
Instructor in Modern Languages.

A. B., A. M., Tufts College, 1898; A. M., Harvard, 1900; Harrison Fellow in Germanic Languages at University of Pennsylvania, 1900-1901; Student at University of Leipzig, 1901-02; Ph. D., University of Pennsylvania, 1902; Instructor in Modern Languages, Collegiate Department, 1902-03; Assistant Professor, 1903– .

FREDERICK A. BUSHEE, PH. D., 45 Hollywood St.
Instructor in Economics and Sociology.

Litt. B., Dartmouth, 1894; A. M., Harvard, 1898; Ph. D., Harvard, 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Collegiate Department, 1902-03: Assistant Professor of Economics, 1903– .

BENJAMIN S. MERIGOLD, PH. D., 59 Chatham St.
Instructor in Chemistry.

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Collegiate Department, 1903– .

GEORGE H. BLAKESLEE, PH. D., 940 Main St.
Instructor in History.

A. B., Wesleyan, 1893; A. M., Harvard, 1899; Ph. D., Harvard, 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Collegiate Department, 1903-04; Assistant Professor, 1904- .

PRENTISS C. HOYT, PH. D., 940 Main St.
Instructor in English.

A. B., Middlebury College, 1889; A. M., 1892; A. M., Harvard University, 1899; Ph. D., 1902; Instructor, 1902-04; Assistant Professor of English, Collegiate Department, Clark University, 1904- .

LOUIS N. WILSON, Litt. D., '11 Shirley St.
Librarian of the University and Custodian of the Art Collection.

A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

ANNUAL APPOINTMENTS.

REGINALD BRYANT ALLEN, PH. D., Medford, N. J.
Instructor in Mathematics. 8 Loudon St.

B. S., Rutgers College, 1893; M. S., 1897; Acting Professor of Mathematics, Massachusetts Agricultural College, 1895; Instructor and Assistant Professor of Mathematics, Adelphi College, Brooklyn, N. Y., 1887-1901; Scholar, Clark University, 1901-02; Fellow, 1902-03, 1904-05; Ph. D., *ibid*, 1905.

EDWARD COWLES, M. D., LL. D., Boston, Mass.
Non-Resident Lecturer on Psychiatry.

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn.; 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903. Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886-; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

GEORGE E. PARTRIDGE, PH. D., 54 Hollywood St.
Docent in Psychology.

Special Student in Philosophy, Clark University, 1895-96; Scholar, 1896-98; Honorary Fellow, 1899-1900; Ph. D., Clark University, 1899; Professor of Psychology, State Normal School, Mankato, Minn., 1900-04; Lecturer in Psychology, Clark University, 1904-05.

HONORARY FELLOWS.

FRANK K. BAILEY., B. S., 6 Downing St.
Honorary Fellow in Physics.

B. S., Colorado College, 1898; Scholar in Physics, Clark University, 1898-99; Fellow, 1899-1901; Assistant, Allegheny Observatory, 1901-04; Honorary Fellow in Physics, Clark University, 1904-05; Assistant in Physics, Collegiate Department, Clark University, 1904- .

RUFUS C. BENTLEY, A. M., 7 Downing St.
Honorary Fellow in Pedagogy.

A. B., University of Nebraska, 1894; A. M., 1896; Assistant in Psychology, University of Nebraska, 1893-96; Fellow in Education, Teachers College, Columbia University, 1900-01; Fellow in Pedagogy, Clark University, 1901-03; Honorary Fellow, 1903-05; Professor of Latin and Dean of the Faculty, Collegiate Department, Clark University, 1902-03; Professor of Pedagogy and Dean of the Faculty, 1903- .

ALVIN BORGQUIST, B. S., 800 Main St.
Research Assistant to Dr. Sanford.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford, Jr., University, Jan., 1898-May, 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05.

JOSEPH G. COFFIN, PH. D., 70 Florence St.
Honorary Fellow in Physics.

Student, College Chaptal, Paris, 1892-94; B. S., Massachusetts Institute of Technology, 1898; Assistant to Prof. Cross, Massachusetts Institute of Technology, 1898-1900; Scholar in Physics, Clark University, 1900-01; Fellow and Assistant, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-05; Ph. D., Clark University, 1905; Instructor in Physics, Collegiate Department, Clark University, 1902–05; Assistant Professor, 1905- .

U. WALDO CUTLER, B. S., 63 Lancaster St.
Honorary Fellow in Psychology.

B. S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Göttingen and Geneva Universities, 1879-1881; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881-92; Professor, 1892-1903; Student at Johns Hopkins University, 1889.

JEAN DAWSON, PH. D., Ann Arbor, Mich.,
Honorary Fellow in Biology, 3 Charlotte St.

Graduate, State Normal College, Ypsilanti, Mich., 1896; A. B., University of Michigan, 1902; A. M., 1903; Ph. D., 1905; Assistant in Biology, *ibid.*, 1903-04.

SAMUEL H. DODSON, PH. M., 23 Maywood St.
Honorary Fellow in Pyschology.

Ph. B., Ph. M., Syracuse University, 1900; Professor of Method in History State Normal School, Jamaica, N. Y., 1900-02.

BERTHA C. DOWNING, M. D., Lexington, Mass.,
Honorary Fellow in Psychology and Biology. 5 Charlotte St.

Harvard Annex, 1884; M. D., Woman's Medical College of Pennsylvania, 1896; Member of Clinical Staff New England Hospital, Roxbury, 1900-03; Member of New England Hospital Medical Society; Fellow of the Alumnae Ass'n of the Woman's Medical College of Pennsylvania, 1905-06.

S. B. HASLETT, PH. D., 4 Crown St.
Honorary Fellow in Psychology.

Graduate of the Edinboro (Pa.) State Normal School, 1883; A. B., Grove City College, Pa., 1889; A. M., 1896; Graduate, Allegheny Theological Seminary, 1892; Scholar in Psychology, Clark University, 1898-1900; Fellow, 1900-01; Ph. D., Clark University, 1901; Professor of Psychology and Education, Bible Normal College, Hartford, Conn., and Lecturer in Hartford Theological Seminary, 1901-02; Honorary Fellow in Psychology, Clark University, 1902-05.

FREDERICK H. HODGE, A. M., 919 Main St.
Honorary Fellow in Mathematics.

A. B., Boston University, 1894; A. M., 1899; Special Student, Mass. Normal School, Bridgewater, 1894-95; Professor of Mathematics, John B. Stetson University, 1895-96; Graduate Student in Mathematics, University of Chicago, 1896-97; Scholar in Mathematics, Clark University, 1897-98; Fellow 1898-99, 1901-03; Honorary Fellow, 1903-05; Professor of Mathematics and History, Bethel College, 1899-1901; Instructor in Mathematics, Collegiate Department, Clark University, 1902-05; Assistant Professor, 1905- .

FRED MUTCHLER, PH. D., Terre Haute, Ind., 8 Lowell St.
Honorary Fellow in Biology.

A. B., Indiana University, 1902; Scholar in Biology, Clark University, 1902-03; Fellow, 1903-04; Hon. Fellow, 1904-05; Ph. D., Clark University, 1905; Instructor in Botany, Collegiate Department, Clark University, 1902- ; Professor of Biology, Conn. State Agricultural College, 1904-05.

JAMES P. PORTER, A. M., 938 Main St.
Honorary Fellow in Psychology.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-05; Instructor in Psychology, Collegiate Department, Clark University, 1903- .

JONATHAN RIGDON, PH. D., 28 Downing St.
Honorary Fellow in Psychology.

A. B., Central Normal College, Ind., 1885; A. B., Boston University, 1891; Instructor in Psychology and Philosophy, Central Normal College, 1895-1903; President, *ibid.*, 1900-1903; Hon. Fellow in Psychology, Clark University, 1904-05; Ph. D., Boston University, 1905; Assistant in the History of Philosophy and Ethics, Collegiate Department, Clark University, 1905- .

RURIC NEVEL ROARK, PH. D., Lexington, Ky.,
Honorary Fellow in Psychology. 12 Wyman St.

A. B., Normal University, Lebanon, Ohio, 1880; Professor of Natural Science, *ibid.*, 1880-85; Principal of Normal School, Glasgow, Ky., 1885-1889; Ph. D., Normal University, 1896; Dean, Dept. of Pedagogy, Kentucky State College, 1889-1905.

W. F. ROBIE, M. D., Baldwinville, Mass.
Honorary Fellow in Psychology and Biology.

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902- ; Student in Psychology and Biology, Clark University, 1904-05.

THEODATE L. SMITH, PH. D., 23 Maywood St.
Research Assistant to Dr. Hall.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student, Clark University, 1895-96; Ph. D., Yale, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, Oct., 1904-Feb.-05; Berlin University, April-Aug.-1905.

MYRON W. STICKNEY, A. M., 28 Freeland St.
Honorary Fellow in Biology.

A. B., Bates College, 1893; A. M., Brown University, 1895; Graduate Student, Brown University, 1896-97; Fellow in Biology, Clark University, 1900-01; Honorary Fellow, 1903-05.

MILLETT TAYLOR THOMPSON, PH. D., 23 Maywood St.
Honorary Fellow in Morphology.

A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-05; Instructor in Zoölogy, Collegiate Department, Clark University, 1902- .

FELLOWS AND SCHOLARS.

ALBERT H. N. BARON, B. A., Silver Plume, Colo.,
Fellow in Psychology. 7 Downing St.

B. A., University of Colorado, 1904; Assistant in English, *ibid.*, 1903-04.

WILLIAM FREDERICK BOOK, A. B., Princeton, Ind.,
Fellow in Psychology. 44 May St.

A. B., Indiana University, 1900; Fellow in Psychology, Clark University, 1903-05; Professor of Philosophy and Education, University of Montana, Feb., 1905- .

ALFRED A. CLEVELAND, A. M., Astoria, Oregon,
Fellow in Psychology. 24 Beaver St.

A. B.. University of Oregon, 1898; A. M., 1903; Fellow in Pedagogy, Clark University, 1903-05.

ERNEST WILLIAM COFFIN, B. A., Charlottetown, P. E. I.,
Fellow in Psychology. 4 Grand St.

B. A., Dalhousie University, 1902.

WILLIAM F. COPELAND, PH. M., Uhrichsville, Ohio,
Fellow in Biology. 1 Kilby St.

Ph. B., Ohio University, 1902; Ph. M., 1903; Assistant in Biology and Geology, *ibid.*, 1902-05.

ORIS P. DELLINGER, A. B., Bicknell, Ind., 3 Charlotte St.
Fellow in Biology.

Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-05; Assistant in Biology, Collegiate Department, Clark University, 1904- .

FREDERICK N. DUNCAN, A. M., Flat Rock, Ill.,
Fellow in Biology. 28 Downing St.

A. B., Indiana University, 1900; A. M., 1901; Assistant in Chemistry, *ibid.*, 1900-01; Professor of Chemistry, Southwestern University, Georgetown, Texas, 1901-02; Professor of Biology, Emory College, 1902-03; Professor of Chemistry, *ibid.*, 1903-05.

ARNOLD LUCIUS GESELL, PH. B., Alma, Wis.,
Fellow in Pedagogy. 70 Florence St.

Graduate, Stevens Point (Wis.) Normal School, 1899; Ph. B., University of Wisconsin, 1903; Fellow in Pedagogy, Clark University, 1904-05.

DAVID GIBBS, S. B., Idell, N. J., 46 Florence St.
Fellow in Biology.

Graduate, State Normal School, Trenton, N. J., 1892; S. B., Harvard University, 1898; Graduate Student, *ibid.*, 1898-99; Fellow in Pedagogy, Clark University, 1902-03, 1904-05.

DAVID SPENCE HILL, A. B., St. Louis, Mo., 44 May St.
Fellow in Psychology.

Student, Central College, Mo., 1889-1890; A. B., Randolph-Macon College, 1897.

JAMES RALPH JEWELL, A. M., Moran, Kansas,
Fellow in Psychology. 70 Florence St.

A. B., Coe College, 1903; A. M., 1905; Assistant in Psychology, Coe College, 1902-03; Fellow in Psychology, Clark University, 1903-05.

DAVID KELLY, M. A., Seattle, Wash., 17 Oread Place.
Fellow in Physics.

B. S., University of Washington, 1899; M. A., 1901; Tutor in Physics, University of Washington, 1899-1901; Assistant Professor of Physics, 1901-03; Scholar in Physics, Clark University, 1903-04; Fellow, 1904-05.

TOSHI-YASU KUMA, A. B., Tokio, Japan, 87 Woodland St.
Fellow in Psychology.

A. B., Stanford University, 1903; Fellow in Psychology, Clark University, 1903-05.

OLAF K. LIE, Kongsberg, Norway, 45 Woodland St.
Fellow in Mathematics.

Graduate, Cadet-School, Kristiania, 1884.

THOMAS SCOTT LOWDEN, Ph. D., 42 Richards St.
Fellow in Psychology.

Student, Glasgow (Ky.) Normal School, 1887-89; Instructor in English, *ibid.*, 1888-89; A. B., Thiel College, 1893; A. M., and Ph. D., University of Wooster, 1895; Dean of Eastern Indiana Normal School and Professor of Philosophy and Education, 1899-1901; Professor of Pedagogy, De Pauw University, 1901-04; Fellow in Psychology, Clark University, 1904-05; Ph. D., *ibid.*, 1905.

TADASU MISAWA, Takanabe, Japan, 23 Maywood St.
Fellow in Psychology.

Graduate, Tokio Imperial University, 1904.

GEORGE EDMUND MYERS, A. M., Colorado Springs, Col.,
Fellow in Pedagogy. 32 Clifton St.

A. B., Ottawa University, Ottawa, Kansas, 1896; Student in Mathematics, University of Chicago, 1899-1901; A. M., *ibid.*, 1901; Fellow in Pedagogy, Clark University, 1904-05.

CAROLINE A. OSBORNE, M. D., 87 Woodland St.
Fellow in Biology.

M. D., Women's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904- ; Student in Biology, Clark University, 1901-05.

CHARLES EDGAR REBER, Pd. D., Shippensburg, Pa.,
Fellow in Psychology. 28 Downing St.

A. B., Ursinus College, 1893; A. M., 1895; Pd. D., Wooster University, 1897; Graduate Student in English, Harvard, 1897-98; Graduate Student, University of Pennsylvania, 1899-1901; Instructor, State Normal School, Slippery Rock, Pa., 1895-97; Professor, Ursinus College, 1898-99; Head of Dept. of Pedagogy and Psychology, Angola, Ind., Normal College, 1901-03; Instructor in Psychology, State Normal School, Shippensburg, Pa., 1903-04; Fellow in Psychology, Clark University, Oct., 1904-Feb.-05.

JAMES T. ROOD, B. S., 30 John St.
Fellow in Physics.

B. S., Worcester Polytechnic Institute, 1898; Scholar in Physics, Clark University, 1903-04; Fellow, 1904-05.

ANNA A. SCHRYVER, A. B., Ann Arbor, Mich.,
Fellow in Biology. 3 Charlotte St.

Instructor in Science Department, Teachers College, Columbia University, 1892-94; Assistant Professor, *ibid.*, 1894-95; In charge of Botany, Michigan State Normal College, 1895-1900; A. B., University of Michigan, 1903; Student in Psychology and Pedagogy, Clark University, 1903-04; Fellow in Biology, 1904-05.

GEORGE E. STEBBINS, A. B., Shelburne Falls, Mass.,
Fellow in Physics. 27 Downing St.

A. B., Bates College, 1903; Assistant in Physics, Bates College, 1903-04; Scholar in Physics, Clark University, 1904-05.

WILLIAM E. STORY, JR., A. B., 17 Hammond St.
Fellow in Physics.

A. B., Harvard University, 1904; Scholar in Physics, Clark University, 1904-05.

LLOYD A. H. WARREN, M. A., Balderson, Canada,
Fellow in Mathematics. 8 Loudon St.

M. A., Queen's University, Kingston, Canada, 1902; Tutor in Mathematics, *ibid.*, 1902-04; Fellow in Mathematics, Clark University, 1904-05; Assistant in Mathematics, Collegiate Department, Clark University, 1905- .

ROBERT IRVING BRAMHALL, A. B., 10 Dewey St.
Scholar in History.

A. B., Collegiate Department, Clark University, 1905.

FREDERICK NORTON COOKE, JR., A. B., 5 Lagrange St.
Scholar in Economics.

A. B., Collegiate Department, Clark University, 1905.

CHARLES E. DISNEY, A. B., 31 Edwards St.
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

GEORGE LEONARD DROWNE, PH. B., Providence, R. I.,
Scholar in English. 10 Sycamore St.

Ph. B., Brown University, 1898.

ARTHUR H. ESTABROOK, A. B., Leicester, Mass.,
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

BURTON N. GATES, A. B., 10 Charlotte St.
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

ELMER A. HARRINGTON, A. B., Winchendon, Mass.,
Scholar in Physics. 44 May St.

A. B., Collegiate Department, Clark University, 1905.

J. WILLIAM HARRIS, A. B., Lexington, Ky.,
Scholar in Psychology. 70 Florence St.

A. B., Union College, Barbourville, Ky., 1901.

EUCLID HÉLIE, A. B., Grande Ligne, Quebec,
Scholar in Psychology. 11½ Fairfield St.

A. B., McMaster University, Toronto, Canada, 1905.

THOMAS F. KANE, 517 Southbridge St.
Scholar in Modern Languages.

A. B., Holy Cross College, 1905.

WILLIAM HAROLD KEITH, A. B., 24 Beaver St.
Scholar in History.

A. B., Collegiate Department, Clark University, 1905.

C. ALLAN LYFORD, B. S., 676 Pleasant St.
Scholar in Chemistry.

B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Assistant in Biology and Chemistry, Collegiate Department, Clark University, 1904-05; Assistant in Chemistry, 1905- .

MAURICE WALTER MEYERHARDT, 5 Clayton St.
Scholar in Psychology.

Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-05.

HERBERT POOLE, 24½ Florence St.
Scholar in Pedagogy.

Graduate, State Normal School, Castine, Me., 1897.

J. ADAMS PUFFER, B. A., Gardner, Mass.,
Scholar in Pedagogy.

B. A., Wesleyan University, 1896; S. T. B., Boston University, 1900.

PUDUR RAJARATNAM, B. A., Madras, India,
Scholar in Physics. 18 Clifton St.

B. A., Madras University, 1891; Post-Graduate Student, Madras Christian College, 1891-93; Student, London University, 1903-04.

HARRY SCHÜRMANN, A. B., 40 Chatham St.
Scholar in Modern Languages.

A. B., Collegiate Department, Clark University, 1905.

HERMON L. SLOBIN, A. B., 3 Blake St.
Scholar in Mathematics.

A. B., Collegiate Department, Clark University, 1905.

JAMES ALEXANDER THOMS, PH. D., Tyngsboro, Mass.,
Scholar in Psychology. 27 Downing St.

Ph. D., Garfield University, 1889; B. D., Rochester Theological Seminary, 1892; Scholar in Philosophy and Sociology, University of Chicago, 1893-94; Tutor in History, *ibid.*, 1893.

REGINALD L. WEBB, A. B., Swampscott, Mass.,
Scholar in English. 80 Woodland St.

A. B., Collegiate Department, Clark University, 1905.

SPECIAL STUDENTS.

JOHN M. BEMIS, M. D., 223 Salisbury St.
Student in Psychiatry.

M. D., University of Vermont, 1893.

ROBERT JOHN FLOODY, S. T. B., 43 Endicott St.
Student in Philosophy.

Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-05.

McLEOD HARVEY, A. B., 5 Oread Place.
Student in Philosophy.

A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-05.

WILLIAM W. HASTINGS, PH. D., Springfield, Mass.,
Student in Biology.

A, B., Maryville College, 1886; A. M., 1894; A. M., Haverford College, 1894; Ph. D., 1896; Graduate, Union Theological Seminary, 1891.

ALBERT WELLMAN HITCHCOCK, B. D., 8 Institute Rd.
Student in Philosophy.

A. B., Amherst College, 1882; A. M., 1885; B. D., Yale, 1889; Hooker Fellow, Yale, 1889-90; Yale Fellow, Berlin and Oxford Universities, 1890-91; Student in Philosophy, Clark University, 1902-05.

MAY SALONA HOLMES, M. D.,
Student in Psychology and Biology. Isolation Hospital.

M. D., Woman's Medical College of New York Infirmary, 1895; House Officer, Memorial Hospital, Worcester, 1895-96; Superintendent and Resident Physician, Isolation Hospital, 1896– .

FRANCES A. JUDSON, Chicago, Ill., 84 Woodland St.
Student in Psychology.

ALLAN BALCOM MILLER, A B., 32 Westland St.
Student in Biology.

A. B., Collegiate Department, Clark University, 1905.

ELLSWORTH W. PHILLIPS, 20 Princeton St.
Student in Psychology.

A. B., Williams College, 1888.

INMAN L. WILLCOX, A. M., 138 Elm St.
Student in Philosophy.

A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-05.

WILLIAM ANDREW WOOD, 11 Shelby St.
Student in Philosophy.

A. B., Baldwin University, 1887; A. M., 1890; S. T. B., Boston University, 1890.

ATTENDANTS UPON SATURDAY COURSES.

F. A. ANDREWS,	Worcester, Mass.
MRS. S. VIRGINIA ATWELL,	Worcester, Mass.
CORA A. BALDWIN,	Worcester, Mass.
FRANK HOWE BENEDICT,	Sutton, Mass.
EDITH N. BENTLEY,	Worcester, Mass.
GEORGE F. COLE,	Worcester, Mass.
OLIVER R. COOK,	Worcester, Mass.
CHARLES W. DELANO,	Worcester, Mass.
LEONARD G. FAIRCHILD,	Worcester, Mass.
SARAH L. GOULD,	Worcester, Mass.
MRS. JULIA PAYNE HILL,	Worcester, Mass.
CHARLES E. KEYES,	West Brookfield, Mass.
MARIETTA KNIGHT,	Worcester, Mass.
WILLIAM R. KRAMER,	Winchendon, Mass.
MAURICE J. LACEY,	Worcester, Mass.
LISBETH LARNED,	Worcester, Mass.
JULIA C. MACKIN,	Worcester, Mass.
GRACE ELDRIDGE MIX,	Worcester, Mass.
ANNIE W. NEWELL,	Millbury, Mass.
LUCY H. OLMSTED,	Worcester, Mass.
LUCY A. OSBORNE,	Worcester, Mass.
BESSIE S. PIERCE,	Worcester, Mass.
EDWARD P. ST. JOHN,	Hartford, Conn.
FRANK ARTHUR SCOTT,	Holliston, Mass.
ELISABETH ROSS SHAW,	Waverley, Mass.
KATE E. SMITH,	Worcester, Mass.
ELIZABETH C. WOODMAN,	Worcester, Mass.

FLORENCE CHANDLER, 52 Woodland St.
Clerk of the University.

ADMINISTRATION.

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively through the committees named below, and also through the president of the University.

BOARD OF TRUSTEES.

Edward Cowles,	A. George Bullock,
Thomas H. Gage,	Orlando W. Norcross,
Charles H. Clark,	Francis H. Dewey,
Rockwood Hoar,	Arthur F. Estabrook.

OFFICERS.

President, . .	A. George Bullock,
Vice-President, .	Francis H. Dewey,
Treasurer, . .	Thomas H. Gage,
Secretary, . .	G. Stanley Hall.

COMMITTEES.

Finance.

Thomas H. Gage, A. George Bullock,
Francis H. Dewey.

Buildings.

Thomas H. Gage, Orlando W. Norcross.

Duties of the President of the University.

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows:

BY-LAWS.

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence

over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each Instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any

time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept, and if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS.

The University now consists of a group of eleven departments, in which all its work and that of Instructors, Fellows and Scholars is grouped. These departments are as follows :

I. Mathematics.
II. Physics.
III. Chemistry.
IV. Biology.
V. Anthropology.
VI. Psychology.
VII. Education.
VIII. Economics and Sociology.
IX. History.
X. Modern Languages.
XI. English.

The Faculty.

The Faculty elect Fellows and take action upon general requirements for the Doctor's degree and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission.

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases. At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising, and in earnest.

It is highly desirable that candidates entering any of the eleven departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students per-

mits more or less personal instruction in each case.

Classes of Appointees.

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. Docents.

The highest annual appointment not involving membership in its Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qual-

ify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be $25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work

in the department, but no examination, is required. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. Lectures.

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. Doctors of Philosophy.

Those who have already advanced to the Doc-

tor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. Candidates for the Degree of Doctor of Philosophy.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of a disser-

tation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examination jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury

shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

> That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to the distinction of sex.

Special Rules Concerning the Doctor's Degree.

I. *Residence.* No candidate shall receive the

degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's Degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department and the instructor in the major subject. Before affixing their signatures they shall satisfy themselves, in such manner as they may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every

case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries

of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. Degree of Master of Arts.

This degree is conferred upon candidates who comply with the following requirements :

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty ; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall

be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual Commencement in June of any year

on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. Special Students not Candidates for a Degree.

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, education, economics and sociology, history, or modern languages —but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of

studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. Preliminary Candidates.

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS.

From the George F. Hoar Fund of $100,000, provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees, which makes the value of the appointment $300. A Junior Fellow may receive $100 with remission of fees,

which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A Citizen's Fund.

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund.

Mrs. Eliza W. Field has also given $500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

Purpose and Conditions of Fellowships and Scholarships.

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either

month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, biology, psychology and education.

METHODS.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which

knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given, many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has

been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1906-1907.

I

MATHEMATICS.

Programme for 1906–1907.

INSTRUCTION IN MATHEMATICS.

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

Differential Equations, and Calculus of Variations; 5 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables, Elliptic Functions, and Definite Integrals; 5 hours a week, through the year.

Theory of Numbers; 2 hours a week, one-half year.

Modern Synthetic Geometry; 2 hours a week, one-half year.

Algebraic Substitutions and their Application to the Theory of Equations; 2 hours a week, one-half year.

Algebraic Invariants; 2 hours a week, one-half year.

Finite Differences; 2 hours a week, one-half year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may

be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1906-1907, the following courses are offered.

By PROFESSOR STORY.

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

FINITE DIFFERENCES; 2 hours a week, first half-year.

ALGEBRAIC INVARIANTS; 2 hours a week second half-year.

Advanced courses:

DIFFERENTIAL GEOMETRY; 2 hours a week, first half-year.

THEORY OF ERRORS; 2 hours a week, second half-year.

BY PROFESSOR TABER.

Introductory Course:

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS: 5 hours a week, through the year.

Advanced Course:

THEORY OF GROUPS; 2 hours a week, through the year.

SEMINARY, through the year.

BY PROFESSOR WEBSTER.

[See announcement of Department of Physics, courses 7, 8, 9, 10.]

BY M. DE PEROTT.

Introductory Course:

THEORY OF NUMBERS; 2 hours a week, first half-year.

Advanced Course:

ABELIAN INTEGRALS; 2 hours a week, second half-year.

During the academic years 1889-1906, advanced and special courses have been given in:

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. Theory of Functions according to Cauchy, Riemann, and Weierstrass, with applications.

13. Weierstrass's Theory of Elliptic Functions.

14. Abelian Functions and Integrals.

15. Numerical Computations.

16. Theory of Quadratic Forms.

17. Analysis Situs, particularly the connectedness of surfaces and map-coloring.

18. Surfaces of the Third and Fourth Orders (analytically treated).

19. Plane Curves of the Third and Fourth Orders (analytically treated).

20. Klein's Icosahedron-Theory.

21. Elliptic Modular Functions.

22. Theta-Functions of Three and Four Variables.

23. Riemann's Theory of Hyperelliptic Integrals.

24. Symbolic Logic.

25. Twisted Curves and Developable Surfaces (torses).

26. Rational and Uniform Transformations of Curves and Surfaces.

27. Theory of Functions of a Real Variable.

28. Definite Integrals and Fourier's Series.

29. Ordinary Differential Equations, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's, and Bessel's functions.

30. Partial Differential Equations, including Laplace's, Bessel's, and Lamè's functions.

31. Finite Differences and Probabilities.

32. Applications of the Infinitesimal Calculus to the Theory of Surfaces.

33. Simultaneous Equations, including Restricted Systems.

34. Theory of Transformation Groups.

35. The Application of Transformation Groups to Differential Equations.

36. Theory of Errors.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors ; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.[1] Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities.

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals of which the library has complete or nearly complete sets are the following :

Abhandlungen der math.-phys. Classe der Königl. Sächsischen Gesellschaft der Wissenschaften. Leipzig, 1852 to date. Complete.

Acta Mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American Journal of Mathematics. Published under the auspices of the Johns Hopkins University, Baltimore, 1878 to date. Complete.

Annales scientifiques de l' Ecole Normale supèrieure. Paris, 1864 to date. Complete.

Annali di Matematica Pura ed Applicata. Milano, 1889 to date.

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[1] For requirements see p. 52.

Annals of Mathematics. Published under the auspices of Harvard University, 1899 to date.

Berichte über die Verhandlungen d. König. Sächsischen Gesells. d. Wiss. zu Leipzig, 1889 to date.

Bibliotheca Mathematica. Stockholm, Berlin and Paris, 1887 to date.

Bulletin de la Société Mathématique de France. Paris, 1873 to date. Complete.

Bulletin of the American Mathematical Society. Continuation of the Bulletin of the New York Mathematical Society. New York, 1894 to date. Complete.

Bulletin of the New York Mathematical Society, New York, 1891-94. Complete.

Bulletin des Sciences Mathématiques (Darboux, etc.). Paris, 1870 to date. Complete.

Comptes Rendus hebdomadaires des Séances de l'Académie des Sciences. Paris, 1835 to date. Complete.

Educational Times, and Journal of the College of Preceptors. London, 1890 to date.

Jahrbuch über die Fortschritte der Mathematik. Berlin, 1868 to date. Complete.

Journal de l'École Polytechnique. Paris, 1794 to date. Complete.

Journal de Mathématiques pures et appliquées. (Liouville.) Paris, 1836 to date. Complete.

Journal für die reine und angewandte Mathematik (Crelle, etc.). Berlin, 1826 to date. Complete.

The Mathematical Review, Worcester, Mass.

Mathematische Annalen (Clebsch, etc.). Leipzig, 1869 to date. Complete.

Mathematische und Naturwissenschaftliche Mittheilungen aus den Sitzungsb. d. Königl. Preussischen Akad. der Wissen. zu Berlin. 1892 to date.

Messenger of Mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Nachrichten von der Georg-Augusts-Universität und der Königl. Gessellschaft der Wissenchaften zu Göttingen. 1853-88.

Nouvelles Annales de Mathématiques. Paris, 1842 to date. Complete.

Philosophical Magazine and Journal of Science. London, Edinburgh and Dublin, 1798 to date. Complete.

Philosophical Transactions of the Royal Society. London. 1665 to date. Complete.

Proceeding of the Cambridge Philosophical Society. 1843 to date. Complete.

Proceedings of the London Mathematical Society. London, 1865 to date. Complete.

Proceedings of the Royal Society of London. 1800 to date. Complete.

Quarterly Journal, Pure and Applied, of Mathematics. London, 1857 to date. Complete.

Revue semestrielle des Publications Mathématiques. Amsterdam, 1893 to date. Complete.

Transactions of the American Mathematical Society. Lancaster, Pa., and New York, 1900 to date. Complete.

Transactions of the Cambridge Philosophical Society. 1822 to date. Complete.

Zeitschrift für Mathematik und Physik (Schlömilch, etc.). Leipzig. Complete from Vol. 34 (1888) to date.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS.

Professor Webster will deliver regularly, with a period of two years, the following cycle of unstarred courses. The starred courses have been given, or will be given at irregular intervals. The lectures occupy from five to seven hours weekly.

1. Dynamics. General Principles, Canonical Equations, Methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

2a.* Figure and Motion of the Earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

3a.* Dynamics of Cyclic and Oscillatory Systems, with Applications to Theory of Electricity, Sound and Light.

3b* The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

4. Electricity and Magnetism.

4a.* Recent Developments in Electrical Theory, Including the Theory of Lorentz.

5. Optics, Physical and Geometrical. Elastic and Electromagnetic Wave-theories.

5a*. Comparison of the Theories of the Ether.

6. Thermodynamics, Thermo- and Electro-Chemistry, Kinetic Theory of Gases, Radiation.

7. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Beltrami-Lorentz Equation, Telegrapher's Equation, Methods of Cauchy, Green, and Rie-

mann, Developments in Series, Legendre's, Laplace's, Bessel's and Lamé's Functions.

8.* Linear Differential Equations.

9.* Elliptic Functions, with certain physical applications.

10. Orthogonal Surfaces and Curvilinear Co-ordinates, and their applications.

The courses for the year 1906-07, will be 1, 2, 3, 4, (3b, 4a, 5, 5 a, 6, 7 have been given this year).

(The substance of courses 2, 3 a, and 4 is to be found in Dr. Webster's Treatise on the Theory of Electricity and Magnetism, Macmillan and Co., London and New York. That of courses 1, 2, 2 a, 3, 3 a is contained in his Treatise on Dynamics, B. G. Teubner, Leipzig.)

In addition to the above courses, there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation of summaries of important articles appearing in the journals.

A part of the work of the colloquium consists in the systematic presentation of certain classical researches, connected more or less with the lectures, in preparing which the students make use of the original sources of information, thus gaining much experience in methods of research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

In addition to the lectures announced above, advanced courses may occasionally be given on subjects not included in the list of starred courses.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will

be put at work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat or electricity, certain cases in hydrodynamics and sound, or in the theory

of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "curl," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, as far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The value of a sound knowledge of dynamics to the student of physics cannot be overestimated, and the course in dynamics forms the natural foundation for the remaining courses.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the stu-

dent Lamb's, Gibson's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

Requirements for the Doctor's Degree.

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 7, which are intended to constitute the equivalent of five hours a week for one year. Course 7 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics*, and Riemann-Weber's *Partielle Differentialgleichungen*.

Facilities.

At the beginning of the year 1903-04 the Physical Department was moved from the rooms it formerly occupied in the main building to the unoccupied wing of what was formerly known as the chemical building, which was remodelled to accommodate the department. This affords convenient and commodious quarters separate from all other departments, and quite free from disturbance, the chemical laboratories being in the other wing separated by a tight partition. On the ground floor is a room extending across the end of the building, with windows on three sides, forty-five feet long by twenty-two feet wide, above which are three other similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables. The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The

engine and storage-battery room containing a high-speed steam-engine connected with the heating boiler and a kerosene engine on the same foundation, with the dynamo between, and seventy-five cells of storage-battery, furnishes the power supply. The storage-cells are conveniently arranged so that each one is acccessible from each side, above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switch-boards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the work-shop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine lathes, jeweller's lathe, and planer, and the third room a Rivett precision bench lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been here constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are also given for the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is intended to be used for optical purposes. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch board in the battery-room.

The laboratory is well equipped with apparatus for research,

besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Dr. Webster's "Electricity and Magnetism," and "Dynamics," and a number of interesting models used in teaching dynamics, thermo-dynamics, and electricity, the number of which is continually increasing, and some of which are rarely found. Among these are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's and other thermo-dynamical surfaces.

The Library.

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use.

The library of the Physical Department is large and carefully selected and, in mathematical physics particularly, may fairly be said to contain the best works. Among others may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Tait, Young, Gauss, Fourier, Laplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Watson and Burbury, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchhoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, and a set of the Travaux et Mémoires du Comité International de Poids et Mesures, and of the published memoirs of the Physikalisch-technische Reichsanstalt, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.
Annales de Chimie et de Physique.
Comptes Rendus.
Eclairage Electrique.
Journal of Physical Chemistry.
Nature.
Philosophical Magazine.
Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of The Royal Society.
Science.
Science Abstracts.
Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals:

American Journal of Science.
Annalen der Physik.
Beiblätter zu den Annalen der Physik.
Annales de Chemie et de Physique.
Comptes Rendus.
Eclairage Electrique.
Electrical World.
Electrician.
Elektrotechnische Zeitschrift.
Fortschritte der Physik.
Journal of Physical Chemistry.
Journal de Physique.
Nature.
Il Nuovo Cimento.
Philosophical Magazine.

Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of The Royal Society.
Science.
Science Abstracts.
Verhandlungen der Deutschen Physikalischen Gesellschaft.
Zeitschrift für Instrumentenkunde.

III.

CHEMISTRY.

The courses in chemistry leading to the degree of Master of Arts are intended to provide work of an advanced nature which shall supplement the elementary work of the undergraduate in such a way as to give the student a broader and more comprehensive view of the subject. At the same time it is intended to encourage in the student a desire for independent investigation, and to offer opportunity for doing specialized work. The work in its general nature falls into the two following groups:

I. Courses of lectures and laboratory work designed to increase the student's general knowledge of chemistry, including such subjects as the chemistry of the rare elements, usually not treated in elementary courses; methods of making pure preparations; analytical methods, qualitative and quantitative; electro-chemistry; optical and photo-chemistry and other special branches of physical chemistry; organic preparations and special methods of organic analysis.

II. Research courses in which the knowledge already acquired is applied to the acquisition of further knowledge through the agency of original investigation.

The laboratory work is much more individual in character than is possible in elementary work. The student is encouraged to undertake that line of work in which he is especially interested, and opportunity is offered to take up any special subject desired, under the direc-

tion of the instructor. The laboratory work will thus be varied to suit the needs of the individual and will partake more of the nature of independent investigation than is possible with the prescribed work of elementary courses. This work will be supplemented by lectures dealing with the theoretical aspects of the subject, and accompanied by general reading and seminary work.

The exact nature and amount of work required for the degree of Master of Arts will be determined individually. In general, it will be work of advanced grade to occupy most of the student's time for one year. This work may be all in this department, or it may be partially in one or more other departments, with the approval of the instructors in those departments.

The lecture course will be varied from year to year to meet the requirements of students. For 1906-1907 the following courses will be offered by Dr. Merigold:

Advanced Inorganic Chemistry. Lectures and laboratory work dealing with special analytical methods; sources of error; the chemistry of the rare elements; preparation of pure inorganic compounds. Special consideration will be given in the lectures to the theoretical side of these subjects. The laboratory work may be varied to include any subject along these lines, in which the student may be interested.

Electro-Chemistry. Lectures and laboratory work, dealing with the modern theories of electro-chemical action, including electrolytic action in aqueous and non-aqueous solutions and fused salts; the electrolytic dissociation theory and its application; the laws governing the chemical production of current and electromotive force. Attention will also be given to the more important applications to analytical and synthetical methods, and to technical processes involving electro-chemical action.

An elementary knowledge of the general principles of physical chemistry, electricity and electrical measurements, is a prerequisite for this course.

PHYSICAL CHEMISTRY. Lectures and laboratory work. A general elementary knowledge of the subject is presupposed.

SEMINARY. Reports and discussion of contemporaneous work appearing in current journals, and presentation of special topics.

RESEARCH. Students who have sufficient preparation may take up some line of chemical investigation.

Candidates for the degree who are specializing in chemistry, may, if desired, devote all their time to any one of the subjects outlined above, with the exception of the seminary work, which is required of all who make chemistry a major subject.

Students for whom chemistry is a minor subject may take up any course for which their previous training has prepared them.

In the laboratory work students are expected to become familiar with the literature bearing upon their subject. Consequently a reading knowledge of French and German is essential.

In special cases, when satisfactory reasons exist, either the lectures or the laboratory work of the lecture courses may be taken separately.

IV.

BIOLOGY.

Programme for Year 1906–1907.

Dr. Hodge will offer the following courses:

I. Dynamic Biology and General Physiology. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. Among others, the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. Biological Education. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures, to be arranged for by consultation during the year.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year, history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1906–1907 will finish the cycle.

Neurology.

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows :

IV. Comparative Study of Nervous Systems and Sense Organs. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the differing degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopial preparations and experiments. Laboratory work one afternoon weekly, or will be arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. The Human Nervous System and Sense Organs. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.[1]

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows :

VI. Practical Histology. The course will be a laboratory course, with such lectures, directions and conferences as

[1]For elementary courses in special physiology, histology and hygiene, refer to announcement of biological courses in the Collegiate Department.

may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

Experimental Work.

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. A workshop supplied with lathe and good equipment of tools for working both wood and metal is attached to the laboratory, and with these facilities minor pieces of apparatus may be well made or old apparatus altered to suit the demands of new problems. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems, from which he may select a subject suited to his tastes and attainments. A course

in biology, such as is given in our best colleges and State universities, is sufficient to enable students to begin work here.

It is proposed during the year to focus attention so far as practicable upon experiments relating to heredity, the influence of environment upon variation and upon the study of animal activity, normal rhythms of rest and work in a series of animals as related to structure and physiological condition of the nervous system. Incidentally this will include the gathering of data as to functions and work of animal species.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware which he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these has been to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

The Journal Club meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V.

ANTHROPOLOGY.

Dr. Chamberlain will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. General, embracing: (a) History, scope and relations of the science of Anthropology. (b) Physical Anthropology, Problems, investigations, results, laboratory work. (c) Ethnography. Races and race-origins. (d) Ethnology, Including Sociology; origin and development of the arts and sciences; institutions; mythology; folk-lore; religions. (e) Linguistics. Race and Language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) Criminal and Pathological Anthropology, Physical and Mental, Ethnic Morals. (g) Historical and Archæological. Primitive Man and Primitive Culture.

B. Special Courses upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects: The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; The Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; The Phenomena of Race-Mixture; The Evolution Problems of Humanity; Education among Primitive Peoples; The Anthropological History of America; The Interpretation of Folk-lore; The Psychology of Primitive Peoples; The Trend of Human Progress; The Psychology of Primitive Languages; The Mind of Primitive Man and its Expressions; The Rôle of the Individual in Primitive Culture; Progress and its Criteria; The Orient and

the Occident in their Relations to Human Evolution; The Negro in Africa and in America; The American Indian.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord; senses, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-time, Memory, Attention, Association, Will, Feelings, etc. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Comparative and Genetic Psychology. Observation and experiments upon the mental processes of lower animals, including both microscopical and larger forms, and especially (when practicable) the observation of dawning intelligence during animal infancy; questions of instinct and psychical heredity; and the parts of the general field common to biology and psychology. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies, and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and Nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles's lectures and clinic.

V. Anthropological Psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive

Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do so in two or three years.

The Psychological Laboratory consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Lecture Room; 2, Large Dark Room; 3, Seminary and Departmental Library; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 6, 7 and 8, Rooms for demonstration and research; 9, Shop; 10, Photographic Dark Room; 11, Room for the keeping of animals and for Comparative Psychology. In floor space and favorable situation the Laboratory leaves little to be desired.

The department is well supplied with apparatus for both demonstration and research, and has access also to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the Library is full on Experimental and Physiological Psychology, and upon The Psychology of Religion and the Study of Children. The section on criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of the most important are upon the shelves of the library.

The following courses are announced for the academic year 1906-1907.

Dr. Hall's Courses.

Dr. G. Stanley Hall will give the following courses:

I. The History of Modern Philosophy.

II. The Development of Mind in Animals, Children and the Race. This will be a review course, more by conference than by lecture. It will cover all the main lines needed for child study, a demonstration of the literature on each topic, and also the logic and methodology of the various kinds of work.

III. The Psychology of Religion and of Christianity. This course will be more amplified and cover different ground from that of past years.

IV. The History of Education, beginning in the Orient, and including the education of primitive people and the philosophies of education.

V. Systematic Psychology from an Evolutionary and Empirical Standpoint, beginning with Sensations.

VI. Seminary, at his home, three hours every Monday evening, through the year.

VII. Research.

Dr. Sanford's Courses.

The following courses or their equivalents will be given by Dr. Sanford:

A. Experimental and Comparative Psychology.

1. *Comparative Psychology. The Evolution of mind in the race and the individual.* General theory of evolution; review of the facts of psychogenesis; discussion of special problems. One hour a week, throughout the year.

2. *Psychological Seminary.* Short lecture courses on special topics. Readings from the psychological classics. Reports and discussions on topics of current psychological interest. The work in the Seminary is informal and is varied to suit the needs of those attending it. One hour a week, throughout the year.

3. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. Four hours a week, second half year.

4. *Research.* Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr. Sanford. The laboratories are opened for advanced work at times suited to the convenience of those engaged in it.

B. Social Psychology.

Work on this topic will consist of informal lectures, conferences and assigned reading. One hour a week, throughout the year. The course is intended primarily for those desiring to make psychology a minor subject for the Master's degree.

C. General Psychology.

Students of Pedagogy and others desiring a general and elementary account of the subject are admitted, without extra expense, to the work of the Collegiate Department of Psychology.

Psychiatry.

Dr. Cowles, former head of the McLean Hospital at Waverley, Mass., lecturer on psychiatry, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital.

Dr. Cowles's course for the year 1906-1907 includes the following topics:

1. The dependence of psychiatry upon psychology as essen-

tially the study of mental function and its disorders in the domain of physiology.

2. The relation of psychology and psychiatry to the prevailing morphological conceptions of general medicine and the difficulty of harmonizing them.

3. Mental physiology; imperative ideas, obsessions, and psychological automatism.

4. The mental symptoms of nervous exhaustion. Forms of mental diseases—(mental symptoms essentially constituting the disease-forms).

5 and 6. The "symptomatic and functional" psychoses (not tending to dementia). The phases of "melancholia" and "mania;" "confusional insanity."

7 and 8. The deteriorating psychoses (tending to dementia), Dementia præcox (hebephrenic, katatonic, and paranoid forms), Paresis, Senile dementia.

9. The chronic psychoses (not tending to grave dementia). Involution psychosis. Primary delusional insanity,—paranoia.

10. Insanities from Mental Defect. Imbecility, Idiocy, Moral insanity.

Dr. Cowles's lectures are open without fee:

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is $5.00.

During the current year, Dr. George E. Partridge has lectured on

The Development of Psychological Theory.

VII.

EDUCATION.

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:

I. (a) Child Study. (b) Educational Psychology. (c) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organization of Schools in Different Countries. (b) The Teaching Profession. (c) Motor Education, including manual training, physical education, etc. (d) Moral and Religious Education. (e) Ideals.

The courses in Education for 1906-1907 will be as follows:

Dr. Burnham's Courses.

A. Pedagogical Applications of Psychology. Some of

the most important chapters in psychology in their educational aspects, such as habit, attention, interest, memory. The correlation of physical and psychic processes. Education of the senses. Apperception and association. Diseases of memory. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Suggestion as a factor in education. The training of the will. Mental diseases and faults of school children. Neuroses of development. Psychological contributions to the hygiene of instruction. The point of view is that of genetic psychology. *One hour a week, throughout the year.*

B. The Hygiene of Instruction. Mental hygiene and the hygiene of instruction. The laws of nervous activity in relation to problems of instruction. Fatigue. The period of study. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygiene of grading. The hygiene of discipline, of punishment, etc. *One hour a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to some phase of the history of education. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week throughout the year.*

President G. Stanley Hall's Course.

The History of Education, beginning in the Orient and including the education of primitive people and the philosophies of education.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection

of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of pub-

lication for special investigations undertaken in the department.

Special Students in Education.

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of $20.

VIII.

ECONOMICS AND SOCIOLOGY.

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, with which the student may satisfy the major requirements for the Doctor's degree, and each year such courses will be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology. (See announcement in Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1906-1907 the following courses are offered.

By Professor Wright.

3. Theory and Use of Statistics.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. Labor Problems.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. Seminary.

By Dr. Bushee.

5. Theory of Sociology. (See announcement in Collegiate Department.)

And one or more of the following courses:

1. Economic Theory during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. Literature of Sociology. In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumplowicz, Coste, Durkheim, Kidd, Tarde, and Simmel This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. Socialism and Communism. This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. Seminary in Economics and Sociology. Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX.

HISTORY.

Dr. Blakeslee will offer the following courses :

1. Contemporary History.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information in the various subjects from the lectures and from extended reading ; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

In 1905-06 the subjects studied were : Tibet,—political, religious, and ethnical significance ; Russia,—political, social, and constitutional development, with emphasis upon the causes which brought about the recent revolution ; and the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment.

In 1906-07 the topics treated will probably be : the history of the American Negro and the present Negro problem ; the Awakening of China,—its international relations and recent social and cultural development ; and the Colonial Possessions of the United States, including a sketch of the history of the Dutch, Spanish, and Portuguese colonies, and a comparison of their problems, successes, and failures with those of the United States in the Philippines and Porto Rico.

Each year one of the following courses will also be given :

2. International Law.

The aim of this course will be to give a knowledge of the gen-

eral principles of International Law. So far as possible definite cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. English History—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. The History of the Christian Church.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. Economic History of Europe.

The aim of the course will be to give a general account of the

rise and development of the leading economic and social institutions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students electing in economics.

6. United States History. Different subjects for this course may be taken in succeeding years. For 1906-7 the period studied will be the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. Students will be expected to present reports upon topics assigned by the instructor; these reports will then form the basis for a critical discussion.

In 1905-6 course 1 was given; in 1906-7 course 6 will probably be offered.

X.

MODERN LANGUAGES AND LITERATURE.

The degree of Master of Arts will be given in either German or French upon the satisfactory fulfilment of the following requirements.

1. A general knowledge of the history of either French or German literature. It is intended that this shall include not only a familiarity with the characteristic features of the main literary movements, but also a first-hand acquaintance with the chief masterpieces of the various epochs. To this end standard translations of the principal works, especially those of the older periods, are made accessible to the student and it is expected that he will supplement the work in his special field with extensive reading in the productions of other epochs.

2. The detailed study of some special period in the literature chosen.

3. The presentation of an acceptable thesis on a subject taken from the student's special field.

4. The ability to read and write the language chosen as major subject, with fluency and correctness.

The courses announced below are intended to furnish the basis for the special work of the candidate. One in German and one in French will be offered each year, the choice to depend upon the needs or desires of the candidates. In addition, the advanced courses in German and French regularly offered in the Collegiate Department are open to candidates for the degree of Master of Arts in Modern Languages. It is expected that the candidates will avail themselves of these as far as may be necessary.

Dr. Capen offers the following courses:

GERMAN.

Goethe's Life and Works.

Lessing and Schiller. Their lives and principal writings. Lessing's critical works and Schiller's philosophical essays will receive special attention.

History of the German Drama. A consideration of the main epochs of the German drama from its origin down to the work of contemporary dramatists. Particular attention will be paid to the development of dramatic form and to the work of the principal theorists.

Seminary. One of the following topics will be chosen for the work of the seminary:

1. The German Drama in the Nineteenth Century.
2. The German Novel in the Nineteenth Century.
3. The Modern Tragedy. The principal works of the modern French, German, Norwegian, Russian and English tragic writers, their choice and treatment of tragic themes will be studied.

FRENCH.

The French Novel in the Eighteenth and Nineteenth Centuries.

The Romantic Movement in France. The development of lyric poetry, the novel, the drama and literary criticism.

French Literature in the Second Half of the Nineteenth Century. Realism, Naturalism, Symbolism and contemporary tendencies.

The attention of students in other departments of the University is called to the following undergraduate courses:

Scientific German. The aim of this course will be to aid students in scientific departments to acquire a fair reading knowledge of scientific German. The first part of the course will consist of a brief review of the forms and syntactical principles of the language, accompanied by the reading of some popular scientific works of general interest, such as Helmholtz's Populäre Vorträge, or Wagner's Entwickelungslehre. In the latter part of the course more specialized scientific reading in his own field will be assigned to each student, under the direction of the instructor. *Two hours a week.*

Scientific French. Students of the University who desire to gain facility in reading scientific French may meet the instructor at stated periods for direction and assistance.

Students who have no knowledge of German or French may find it advisable to enter the elementary courses in those languages given in the Collegiate Department.

XI.

ENGLISH.

Dr. Hoyt offers the following courses to candidates for the degree of Master of Arts:

CHAUCER AND SHAKESPEARE. This course traces the growth of their literary power, and endeavors to give a just appreciation of their important works.

SEMINARY IN ENGLISH COMPOSITION. The aim of the course is two-fold:—to give a clearer insight into literary values by the criticism of classroom work as well as of standard authors, and to offer a wide practice in original composition.

CONTEMPORARY LITERATURE. The lectures will deal with the best contemporary work in the essay, the short story, the novel, drama, and poetry.

SEMINARY. The work of this seminary is distinctly individual in character. Each student is urged to choose some topic of special interest to him, and to devote his time to the literature and criticism bearing upon his subject, presenting his results for discussion in this weekly seminary, and giving his final conclusions in the form of a thesis. The greatest freedom of choice is allowed the student to develop, if possible, any latent literary ability.

ENGLISH LITERATURE. A Saturday course in English Literature will also be offered, which will be open to the public at the usual fee. The ground covered by the lectures will be determined by the wishes and needs of the class.

LIBRARY.

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex-officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE.

PRESIDENT G. STANLEY HALL, *Chairman*,
PRESIDENT CARROLL D. WRIGHT,
PROFESSOR WILLIAM E. STORY, *Secretary*.

LIBRARY STAFF.

LOUIS N. WILSON, *Librarian*.

Assistants.

EDITH M. BAKER,
JENNIE L. KNIGHT,
ALBERT J. PECKHAM,
ALICE M. PRENTICE,
MARY S. TERWILLIGER,
MARY D. THURSTON.

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 35,000 bound volumes

and 1,500 pamphlets, and the reading-room receives over 200 journals.

The books are grouped as follows:

A Works of General Reference.
B Journals.
C Mathematics.
C D Math.-Physics.
D Physics.
E Chemistry.
F Biology, Zoology, Botany, Physiology, Neurology.
G Geography.
H Pathology.
I Psychology.
J Philosophy.
K Religious Psychology
L Biography.
M Anthropology.
N Education.
O General Science.
P History.
Q Law.
R Political and Social Science.
S English.
T Modern Languages.
U Classics.
W Practical Arts.
X Library Science.
Y Art.
Z Manuscripts.

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 310 volumes were borrowed from, and 146 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

No. 1. Wilson, Louis N.:
Bibliography of the Published Writings of President G. Stanley Hall. Oct., 1903.

No. 2. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1902.
Jan., 1904.

No. 3. *Proceedings and Addresses* at the Public Opening of the Library Building of Clark University, Thursday, January 14, 1904. Apr., 1904.

No. 4. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1903.
July, 1904.

No. 5. WILSON, LOUIS N.:
Preparing Manuscript for the Press. Jan., 1905.

No. 6. *Founder's Day*, Clark University. Apr., 1905.

No. 7. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1904.
July, 1905.

No. 8. DE PEROTT, JOSEPH:
The Probable Source of the Plot of Shakespeare's Tempest. Oct., 1905.

No. 9. *Proceedings and Addresses* at the Public Opening of the Art Department of Clark University. Dec., 1905.

The department of religious psychology, established within the past two years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which three numbers, constituting Volume 1, have already appeared, and of which the first number of Volume 2 is now in press.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society,

organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 590 newspapers and magazines and 153,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of over 10,000 volumes is also free to all members of the University.

LIBRARY RULES.

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored

by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT.

In his last will and testament the Founder of the University bequeathed

> "the sum of $100,000 as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions, but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings will be published in the PUBLICATIONS OF THE LIBRARY at an early date. A Curator and Custodian of them have been appointed by the Board (see page 92) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS.

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no instructor, Docent, or Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount

likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees, at a meeting held April 4th, 1891, to take effect for the next academic year.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

At a meeting of the Board of Trustees, held January 17, 1905, the following additional rules were enacted:

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction

shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make at the October meeting an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collections shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report if approved shall be filed and preserved.

DEGREES CONFERRED.

On June 21, 1905, the University conferred degrees upon the following persons:

MASTER OF ARTS.

ROWLAND HAYNES, June 16, 1905.
Dissertation: Religious Faith as an Individual Experience.

DOCTORS OF PHILOSOPHY.

REGINALD BRYANT ALLEN, May 25, 1905.
Dissertation: On Hypercomplex Number Systems Belonging to an Arbitrary Domain of Rationality.

CHARLES E. BROWNE, June 13, 1904.
Dissertation: The Psychology of the Simple Arithmetical Processes.
American Journal of Psychology, January 1906, Vol. 17, pp. 1-37.

W. FOWLER BUCKE, June 24, 1904.
Dissertation: Examinations and Grading.

ARTHUR L. CLARK, June 17, 1904.
Dissertation: Surface Tension at the Interface between Certain Liquids and Vapors.
Proceedings of the *American Academy of Arts and Sciences*, January 1906, Vol. 41, pp. 361-381.

JOSEPH GEORGE COFFIN, November 6, 1903.
Dissertation: Construction and Calculation of an Absolute Standard of Self-Inductance.
Bulletin of the Bureau of Standards, 1906, Vol. 1, No. 4.

JOHN S. FRENCH, March 28, 1899.
Dissertation: On the Theory of the Pertingents to a Plane Curve.

JESSE NEVIN GATES, July 1, 1904.
Dissertation: Cubic and Quartic Surfaces in Four-fold Space.

BENJAMIN SPENCER GOWEN, June 12, 1905.
Dissertation: Group Psychoses.

JOHN CHARLES HUBBARD, June 18, 1904.
Dissertation : On the Conditions for Sparking at the Break of an Inductive Circuit.
Physical Review, March, 1906, Vol. 22, pp. 124-158.

HERBERT G. KEPPEL, June 13, 1901.
Dissertation : The Cubic Three-Spread Ruled with Planes in Four-fold Space.

WALTER LIBBY, June 14, 1905.
Dissertation : Poetic Imagination.

THOMAS SCOTT LOWDEN, June 13, 1905.
Dissertation : A Study in Personal Hygiene.
Pedagogical Seminary, March, 1906, Vol. 13, pp. 1-60.

JOSIAH MOSES, June 11, 1904.
Dissertation : Pathological Aspects of Religion.

FRED MUTCHLER, June 13, 1904.
Dissertation : On the Structure and Biology of the Yeast Plant.
Journal of Medical Research, November, 1905, Vol. 14, pp. 13-50.

MAURICE H. SMALL, May 8, 1905.
Dissertation : On Some Psychical Relations of Society and Solitude.
Pedagogical Seminary, April 1900, Vol. 7, pp. 13-69.

LEWIS MADISON TERMAN, June 13, 1905.
Dissertation : Genius and Stupidity.

CHARLES W. WADDLE, June 16, 1905.
Dissertation : Miracles of Healing.

ROY T WELLS, June 17, 1903.
Dissertation : Experiments on the Self-Induction of Currents in Cylindrical Cores.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements :

EUGENE W. BOHANNON,
WILLIAM F. BOOK,
ALVIN BORGQUIST,
A. CASWELL ELLIS,
MELANCHTHON F. LIBBY,
JAMES P. PORTER.

PUBLICATIONS RELATING TO THE UNIVERSITY.

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 91, 92, and 1903, the annual Report of the President to the Board of Trustees was printed.

A Summer School has been held each year since 1892, with the exception of 1893, 1900, 1902, 1904 and 1905, and in such years a Summer School Programme has been issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume :

Clark University, 1889-1899. Decennial Celebration, 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899 ; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS.

The American Journal of Psychology. This Journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the

important literature in its field. Price, $5 per volume ; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The Pedagogical Seminary. This Journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers —issued in March, June, September and December. Price, $5 per volume ; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The Mathematical Review. This journal, of which the first volume is in course of publication, is edited by William E. Story. Its scope includes original research in mathematics, résumés of subjects of a more elementary character, pedagogical and historical sketches, and bibliographical notices. Every volume will consist of four numbers of 96 pages each. Each number contains the portrait of some distinguished mathematician. Price, $5 a volume. Published by the editor, Worcester, Mass.

The American Journal of Religious Psychology and Education. This journal was begun in May, 1904, and appears three times a year. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and prints original articles. Each number contains about 100 pages. Price, $3.50 per volume, $1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

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The Clark University in the City of Worcester Massachusetts

Register and Nineteenth Official Announcement

1907

BOARD OF TRUSTEES

Edward Cowles	A. George Bullock
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OFFICERS

President . .	A. George Bullock
Vice-President .	Francis H. Dewey
Treasurer . .	Thomas H. Gage
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COMMITTEES

Finance

Thomas H. Gage — A. George Bullock — Francis H. Dewey

Buildings

Thomas H. Gage — Orlando W. Norcross

*Deceased November 1, 1906

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER

AND

Nineteenth Official Announcement

WORCESTER, MASSACHUSETTS
PUBLISHED FOR THE UNIVERSITY
March, 1907

CALENDAR, 1907-1908

1907			
April	1	Monday	Spring Recess
April	6	Saturday	
April	19	Friday	Patriots' Day
May	30	Thursday	Memorial Day
June	20	Thursday	Eighteenth academic year closes
		Summer Vacation of 14 Weeks	
Sept.	26	Thursday	Nineteenth academic year begins
Nov.	28	Thursday	Thanksgiving Day
Dec.	25	Wednesday	Christmas Recess
1908			
Jan.	4	Saturday	
Feb.	1	Saturday	Founder's Day*
Feb.	22	Saturday	Washington's Birthday
Mar.	30	Monday,	Spring Recess
April	4	Saturday	
April	20	Monday	Patriots' Day
May	30	Saturday	Memorial Day
June	18	Thursday	Nineteenth academic year closes

*Not a holiday

MEMBERS

STAFF

G. STANLEY HALL, PH. D., LL. D. 94 Woodland St.
President of the University and Professor of Psychology

A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888; Williams College, 1889, and Johns Hopkins University, 1902; Curator of the Art Collection, Clark University. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D. 17 Hammond St.
Professor of Mathematics

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark College, 1902- . Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D. 24 Richards St.
Professor of Experimental and Comparative Psychology

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903- .

ARTHUR G. WEBSTER, PH. D., D. SC. 66 West St.
Professor of Physics

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; Professor of Physics, Clark College, 1902- ; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences.

HENRY TABER, PH. D. 65 West St.
Professor of Mathematics

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D. 96 Woodland St.
Professor of Statistics and Social Economics

President, Clark College, 1902- .

CLIFTON F. HODGE, PH. D. 3 Charlotte St.
Professor of Biology

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902– .

WILLIAM H. BURNHAM, PH. D. 100 Chatham St.
Professor of Pedagogy

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900-1906.

ALEXANDER F. CHAMBERLAIN, PH. D. 19 Baker St.
Assistant Professor of Anthropology

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian;* Editor, *Journal of American Folk-Lore;* Corresponding Member, O Instituto do Coimbra, Portugal; Member of the American Antiquarian Society.

JOSEPH DE PEROTT 5 Gates St.
Lecturer in Mathematics

Student, Universities of Paris and Berlin, 1877-80.

LOUIS N. WILSON, Litt. D. 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

FREDERICK A. BUSHEE,* PH. D. 45 Hollywood St.
Instructor in Economics and Sociology

Litt. B., Dartmouth College, 1894; A. M., Harvard University, 1898; Ph. D., 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Clark College, 1902-03; Assistant Professor of Economics, *ibid.*, 1903– .

BENJAMIN S. MERIGOLD, PH. D. 59 Chatham St.
Instructor in Chemistry

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard University, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Clark College, 1903– .

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*On leave of absence, 1905-06.

GEORGE H. BLAKESLEE, PH. D. 940 Main St.
Instructor in History

A. B., Wesleyan University, 1893; A. M., Harvard University, 1899; Ph. D., 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03, Instructor in History, Clark College, 1903-04; Assistant Professor, *ibid.*; 1904- .

ANNUAL APPOINTMENTS

EDWARD COWLES, M. D., LL. D. Boston, Mass.
Non-Resident Lecturer on Psychiatry

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886- ; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

HONORARY FELLOWS

ALVIN BORGQUIST, PH. D.
Honorary Fellow in Psychology 64 Woodland St.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford Jr. University, January 1898-May 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05; Research Assistant to Professor Sanford, 1905-06; Ph. D., Clark University, 1906.

FREDERICK J. B. CORDEIRO, M. D.
Honorary Fellow in Physics 21 Oberlin St.

A. B., Harvard University, 1881; M. D., 1884; Retired Surgeon, United States Navy; Student, University of Berlin, 1890-91; 1894-95.

U. WALDO CUTLER, B. S.
Honorary Fellow in Psychology 63 Lancaster St.

B. S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Göttingen and Geneva Universities, 1879-1881; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881-92; Professor, 1892-1903; Student at Johns Hopkins University, 1889; Honorary Fellow in Psychology, Clark University, 1905-06.

JEAN DAWSON, PH. D., Ann Arbor, Mich.
Honorary Fellow in Biology 46 Florence St.

Graduate State Normal College, Ypsilanti, Mich., 1896; A. B., University of Michigan, 1902; A. M., 1903; Ph. D., 1905; Assistant in Biology, *ibid.*, 1903-04; Honorary Fellow in Biology, Clark University, 1905-06.

BERTHA C. DOWNING, M. D., Lexington, Mass.
Honorary Fellow in Psychology

Harvard Annex, 1884; M. D., Woman's Medical College of Pennsylvania, 1896; Member of Clinical Staff, New England Hospital, Roxbury, 1900-03; Member of New England Hospital Medical Society; Fellow of the Alumnae Ass'n of the Woman's Medical College of Pennsylvania, and Honorary Fellow in Psychology and Biology, Clark University, 1905-06.

CHARLES WILSON EASLEY, A. M.
Honorary Fellow in Chemistry 87 Woodland St.

A. B., Dickinson College, 1897; A. M., 1899; Scholar in Physics, Clark University, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Instructor in Chemistry, Clark College, 1902– .

GORDON SCOTT FULCHER, M. S., Evanston, Ill.
Research Assistant to Professor Webster 18 Gates St.

B. S., Northwestern University, 1905; M. S., 1906; Fellow in Physics, *ibid.*, 1905-06.

S. B. HASLETT, PH. D.
Honorary Fellow in Psychology 9 Randall St.

Graduate of the Edinboro (Pa.) State Normal School, 1883; A. B., Grove City College, Pa., 1889; A. M., 1896; Graduate, Allegheny Theological Seminary, 1892; Scholar in Psychology, Clark University, 1898-1900; Fellow, 1900-01; Ph. D., Clark University, 1901; Professor of Psychology and Education, Bible Normal College, Hartford, Conn., and Lecturer in Hartford Theological Seminary, 1901-02; Honorary Fellow in Psychology, Clark University, 1902-06.

FREDERICK H. HODGE, A. M.
Honorary Fellow in Mathematics '24 Hollywood St.

A. B., Boston University, 1894; A. M., 1899; Special Student, Mass. Normal School, Bridgewater, 1894-95; Professor of Mathematics, John B. Stetson University, 1895-96; Graduate Student in Mathematics, University of Chicago, 1896-97; Scholar in Mathematics, Clark University, 1897-98; Fellow, 1898-99, 1901-03; Honorary Fellow, 1903-06; Professor of Mathematics and History, Bethel College, 1899-1901; Instructor in Mathematics, Clark College, 1902-05; Assistant Professor, 1905– .

JOHN CHARLES HUBBARD, PH. D.
Honorary Fellow in Physics 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02; Fellow, 1902-04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904-05; Assistant Professor of Physics, New York University, 1905-06; Assistant Professor of Physics, Clark College, 1906– .

FRED KUHLMANN, PH. D., Grand Island, Neb.
Research Assistant to Professor Sanford 44 May St.

A. B., University of Nebraska, 1899; A. M., 1901; Scholar and Assistant in Psychology, *ibid.*, 1899-1900; Fellow and Assistant, 1900-01; Fellow in Psychology, Clark University, 1901-02; Fellow and Assistant, 1902-03; Ph. D., Clark University, 1903; Honorary Fellow and Assistant, 1903-05; Assistant in Psychology, University of Wisconsin, 1905-06.

THOMAS SCOTT LOWDEN, PH. D.
Honorary Fellow in Psychology 42 Richards St.

Student, Glasgow (Ky.) Normal School, 1887-89; Instructor in English, *ibid.*, 1888-89; A. B., Thiel College, 1893; A. M. and Ph. D., University of Wooster, 1895; Dean of Eastern Indiana Normal School and Professor of Philosophy and Education, 1899-1901; Professor of Pedagogy, De Pauw University, 1901-04; Fellow in Psychology, Clark University, 1904-06; Ph. D., Clark University, 1905.

CAREY EYSTER MELVILLE, B. A.
Honorary Fellow in Mathematics 101 May St.

B. A., Northwestern University, 1901; Fellow in Mathematics, *ibid.*, 1901-02; Graduate Student in Mathematics, Johns Hopkins University, 1902-03; Instructor in Mathematics, Case School of Applied Science 1903-06; Assistant in Mathematics, Clark College, 1906- .

JOSIAH MOSES, PH. D., Richmond, Va.
Honorary Fellow in Psychology 815 Main St.

A. B., Richmond College, 1899; A. M., 1900; Scholar in Psychology, Clark University, 1900-01; Fellow, 1901-04; Honorary Fellow and Assistant, 1904-05; Ph. D., Clark University, 1905; Instructor in Psychology and Education, University of Texas, 1905-06.

CAROLINE A. OSBORNE, M. D.
Honorary Fellow in Biology 87 Woodland St.

M. D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904- ; Student in Biology, Clark University, 1901-05; Fellow, 1905-06.

JAMES P. PORTER, PH. D.
Honorary Fellow in Psychology 938 Main St.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of Work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-06; Ph. D., Clark University, 1906; Instructor in Psychology, Clark College, 1903- .

W. F. ROBIE, M. D., Baldwinville, Mass.
Honorary Fellow in Psychology and Biology

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902- ; Student in Psychology and Biology, Clark University, 1904-05; Honorary Fellow, 1905-06.

THEODATE L. SMITH, PH. D.
Research Assistant to President Hall 23 Maywood St.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, October 1904-February 1905; Berlin University, April-August, 1905; Research Assistant to President Hall, Clark University, 1905-06.

MILLETT TAYLOR THOMPSON, PH. D.
Honorary Fellow in Morphology 23 Maywood St.

A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-06; Instructor in Zoölogy, Clark College, 1902-06; Assistant Professor 1906- .

FELLOWS AND SCHOLARS

LEWIS FLINT ANDERSON, M. A., Marquette, Mich.
Fellow in Pedagogy 10 Montague St.

B. A., University of Toronto, 1893; M. A., 1902; Student, University of Leipzig, 1897-99; Instructor in Psychology and Education, State Normal School, Marquette, Mich., 1899- .

NORMAN HERBERT ANNING, M. A., Oxmead, Canada.
Fellow in Mathematics 8 Loudon St.

B. A., Queen's University, Kingston, Canada, 1905; M. A., 1906; Tutor in Physics, *ibid.*, 1903-04; Tutor in Mathematics, 1904-05.

HORACE L. BRITTAIN, M. A., Woodstock, N. B.
Fellow in Psychology 101 May St.

B. A., University of New Brunswick, 1895; M. A., 1898; Scholar in Psychology, Clark University, 1904-05.

ERNEST WILLIAM COFFIN, B. A., Charlottetown, P. E. I.
Fellow in Psychology 78 Florence St.

B. A., Dalhousie University, 1902; Fellow in Psychology, Clark University, 1905-06.

WILLIAM F. COPELAND, PH. M., Uhrichsville, Ohio.
Fellow in Biology 1 Kilby St.

Ph. B., Ohio University, 1902; Ph. M., 1903; Assistant in Biology and Geology, *ibid.*, 1902-05; Fellow in Biology, Clark University, 1905-06.

ORIS P. DELLINGER, A. B., Bicknell, Ind.
Fellow in Biology 3 Charlotte St.

Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-06; Assistant in Biology, Clark College, 1904- .

CHARLES E. DISNEY, A. B.
Fellow in Biology 31 Edwards St.

A. B., Clark College, 1905; Scholar in Biology, Clark University, 1905-06; Assistant in Biology, Clark College, 1905-06.

ARTHUR H. ESTABROOK, A. M., Leicester, Mass.
Fellow in Biology

A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Biology, *ibid.*, 1905-06; Assistant in Biology, Clark College, 1906- .

WILLIS L. GARD, A. B., Elkhart, Ind.
Fellow in Psychology 3 Charlotte St.

A. B., Indiana University, 1896.

BURTON N. GATES, A. M.
Fellow in Biology 10 Charlotte St.

A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Biology, *ibid.*, 1905-06; Assistant in Biology, Clark College, 1906- .

ELMER A. HARRINGTON, A. M., Winchendon, Mass.
Fellow in Physics 44 May St.

A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Physics, *ibid.*, 1905-06; Assistant in Chemistry, Clark College, 1905-06; Assistant in Physics, 1906- .

JAMES WILLIAM HARRIS, A. B., Lexington, Ky.
Fellow in Psychology 78 Florence St.

A. B., Union College, Barbourville, Ky., 1901; Scholar in Psychology, Clark University, 1905-06.

EUCLID HÉLIE, A. B., Grande Ligne, Quebec.
Fellow in Psychology 101 May St.

A. B., McMaster University, Toronto, Canada, 1905; Scholar in Psychology, Clark University, 1905-06.

DAVID SPENCE HILL, A. B., St. Louis, Mo.
Fellow in Philosophy 46 Florence St.

A. B., Randolph-Macon College, 1897; Student, Washington University Law School, 1901-02; Fellow in Psychology, Clark University, 1905-06.

HIKOZO KAKISE, Oitaken, Japan.
Fellow in Psychology 76 Woodland St.

Graduate, Tokio Imperial University, 1901; Assistant in Psychology, *ibid.*, 1902-06.

OLAF K. LIE, Kongsberg, Norway.
Fellow in Mathematics 522 Pleasant St.

Graduate, Cadet-School, Kristiania, 1884; Fellow in Mathematics, Clark University, 1905-06.

NEWTON MILLER, M. A., Thorntown, Ind.
Fellow in Biology 78 Florence St.

A. B., Indiana University, 1905; A. M., 1906.

TADASU MISAWA, Takanabe, Japan.
Fellow in Psychology 46 Woodland St.

Graduate, Tokio Imperial University, 1904; Fellow in Psychology, Clark University, 1905-06.

GEORGE ORDAHL, A. M., Eugene, Ore.
Fellow in Pedagogy 6 Hancock St.

B. S., Valparaiso College, 1899; A. B., University of Oregon, 1905; A. M., 1906.

JOSEPH ADAMS PUFFER, B. A., Gardner, Mass.
Fellow in Pedagogy

B. A., Wesleyan University, 1896; S. T. B., Boston University, 1900; Scholar in Pedagogy, Clark University, 1905-06.

HERMON L. SLOBIN, A. B.
Fellow in Mathematics 3 Blake St.

A. B., Clark College, 1905; Scholar in Mathematics, Clark University, 1905-06.

GEORGE E. STEBBINS, A. B., Shelburne Falls, Mass.
Fellow in Physics 17 Oread Place.

A. B., Bates College, 1903; Assistant in Physics, *ibid.*, 1903-04; Scholar in Physics, Clark University, 1904-05; Fellow, 1905-06.

WILLIAM E. STORY, JR., A. B.
Fellow in Physics 17 Hammond St.

A. B. Harvard University, 1904; Scholar in Physics, Clark University, 1904-05; Fellow, 1905-06.

JESSE HAYES WHITE, A. M., Alamo, Ind.
Fellow in Psychology 18 Gates St.

A. B., Indiana University, 1903; A. M., 1904; Assistant in Experimental Psychology, *ibid.*, 1903-04.

CHARLES W. BACON, A. B., North Oxford, Mass.
Scholar in Chemistry
A. B., Clark College, 1906.

FRANCIS M. BALDWIN, A. B., West Upton, Mass.
Scholar in Biology 2 Grand St.
A. B., Clark College, 1906.

ROBERT IRVING BRAMHALL, A. M.
Scholar in History 10 Dewey St.
A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in History, *ibid.*, 1905-06; Assistant in History, Clark College, 1905- .

JOHANNES BROENE, Pd. B., Grand Rapids, Mich.
Scholar in Psychology 78 Florence St.
Pd. B., Valparaiso University, 1906.

HERBERT BURNHAM DAVIS, A. B.
Scholar in Psychology 54 Florence St.
A. B., Bates College, 1890.

EDITH MONTGOMERY DIXON, A. B.
Scholar in Biology 11 Walnut St.
A. B., Vassar College, 1906.

LOUISE ELLISON, A. B., St. Louis, Mo.
Scholar in Psychology 2 Woodbine St.
A. B., Washington University, 1906.

ROBERT JOHN FLOODY, S. T. B.
Honorary Scholar in Psychology 43 Endicott St.
Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-06.

ARTHUR OLIN GRIGGS, Ph. B., Westford, Conn.
Scholar in Pedagogy 6 Hudson St.
Ph. B., Wesleyan University, 1898; Professor of Mathematics, Virginia Union University, 1902-04.

WILLIAM HAROLD KEITH, A. M.
Scholar in History 24 Beaver St.
A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in History, *ibid.*, 1905-06.

C. ALLAN LYFORD, A. M.
Honorary Scholar in Chemistry 32 Clifton St.
B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Assistant in Biology and Chemistry, Clark College, 1904-05; Assistant in Chemistry, 1905- ; Scholar in Chemistry, 1905-06; A. M., Clark University, 1906.

MAURICE WALTER MEYERHARDT
Scholar in Psychology 5 Clayton St.
Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-06.

ALLAN BALCOM MILLER, A. B.
Scholar in Biology — 32 Westland St.
A. B., Clark College, 1905; Student in Biology, Clark University, 1905-06.

CARLETON B. NICKERSON, A. B., Boothbay Harbor, Me.
Scholar in Chemistry — Spencer, Mass.
A. B., Clark College, 1906.

TIMOTHY J. STEVENSON, A. B.
Scholar in Psychology — 6 Gladstone St.
A. B., Clark College, 1906.

JUN WATANABE, Tokio, Japan.
Scholar in Economics — 46 May St.
Graduate, Keiogizuku (College) University, 1905.

SPECIAL STUDENTS

JOHN MERRICK BEMIS, M. D.
Student in Psychiatry — 223 Salisbury St.
M. D., University of Vermont, 1893.

SUZANNE BRETT, Buffalo, N. Y.
Student in Economics and Sociology — 66 Pleasant St.

CARL J. HARRIS, PH. C.
Student in Chemistry — 29 King St.
Ph. C., Massachusetts College of Pharmacy, 1905.

McLEOD HARVEY, A. B.
Student in Philosophy — 5 Oread Place
A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-06.

MAY SALONA HOLMES, M. D.
Student in Psychology — Isolation Hospital
M. D., Woman's Medical College of New York Infirmary, 1895; House Officer, Memorial Hospital, Worcester, 1895-96; Superintendent and Resident Physician, Isolation Hospital, 1896- ; Student in Psychology and Biology, Clark University, 1905-06.

EDWARD B. SAUNDERS, A. B., Fitchburg, Mass.
Student in Psychology.
B. D., St. Lawrence University, 1900; A. B., 1904.

WILLIAM G. SIDDELL, A. B., Westboro, Mass.
Student in Psychology
A. B., Syracuse University, 1902.

H. LOUIS STICK, M. D.
Student in Psychology — Worcester Insane Asylum
M. D., College of Physicians and Surgeons, Baltimore, 1900; Resident Physician, Baltimore City Hospital, June 1900-November 1901; Interne, Criminal Insane Asylum, Bridgewater, November 1901-February 1903; Assistant Resident Physician, Worcester Insane Asylum, February 1903- .

INMAN L. WILLCOX, A. M.
Student in Philosophy 138 Elm St.

A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-06.

ATTENDANTS UPON SATURDAY COURSES

O. H. ADAMS	Leicester
ANNA L. CALLAHAN	Worcester
MARY J. CALLAHAN	Worcester
MRS. H. B. DAVIS	Worcester
MRS. MARY A. DAVIS	Worcester
SARAH L. GOULD	Worcester
FLORENCE E. KEITH	Worcester
MARIETTA KNIGHT	Worcester
EMMA A. LEGG	Worcester
RAYMOND McFARLAND	Leicester
O. A. MORTON	Marlboro
ELIZABETH O'MALLEY	Worcester
LUCY A. OSBORNE	Worcester
ETTA SINSABOUGH	Leicester
KATE E. SMITH	Worcester
LUCY H. OLMSTED	Worcester

FLORENCE CHANDLER
Clerk of the University 52 Woodland St.

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively through the committees named below, and also through the president of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure

their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows :

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty and to increase their efficiency in research

and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon

the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of a group of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Anthropology
VI. Psychology
VII. Pedagogy
VIII. Economics and Sociology
IX. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising, and in earnest.

It is highly desirable that candidates entering any of the nine departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students per-

mits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. Docents

The highest annual appointment not involving membership in its Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qual-

ify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be $25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work

in the department, but no examination, is required. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standing of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. Lectures

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. Doctors of Philosophy

Those who have already advanced to the Doc-

tor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. Candidates for the Degree of Doctor of Philosophy

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had a substantial equivalent for the training implied by that degree.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be re-

ported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examination jury composed of at least four members, including

the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules Concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department and the instructor in the major subject. Before affixing their signatures they shall satisfy themselves, in such manner as they may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The disser-

tation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may

be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. Degree of Master of Arts.

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic

year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. Special Students not Candidates for a Degree

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed en-

tire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. Preliminary Candidates

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees, which makes the value of the appointment $300. A Junior Fel-

low may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A Citizen's Fund.

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund

Mrs. Eliza W. Field has also given $500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1 Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

Purpose and Conditions of Fellowships and Scholarships

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either

month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, biology, psychology, pedagogy, and economics.

METHODS

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which

knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has

been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1907-1908.

I

MATHEMATICS

Programme for 1907-1908

INSTRUCTION IN MATHEMATICS

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

Differential Equations, and Calculus of Variations; 5 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables, Elliptic Functions, and Definite Integrals; 5 hours a week, through the year.

Theory of Numbers; 2 hours a week, one half-year.

Modern Synthetic Geometry; 2 hours a week, one half-year.

Algebraic Substitutions and their Application to the Theory of Equations; 2 hours a week, one half-year.

Algebraic Invariants; 2 hours a week, one half-year.

Finite Differences; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these

subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1907-1908, the following courses are offered

By PROFESSOR STORY

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

ALGEBRAIC INVARIANTS; 2 hours a week, first half-year.

Advanced courses:

DIFFERENTIAL GEOMETRY; 2 hours a week, first half-year.

THEORY OF ERRORS; 2 hours a week, second half-year.

NON-EUCLIDEAN GEOMETRY; 2 hours a week, second half-year.

By PROFESSOR TABER

Introductory Course:

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

Advanced Course:

TRANSFORMATION GROUPS; 2 hours a week, through the year.
SEMINARY, through the year.

By PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 7, 8, 9, 10.]

By M. DE PEROTT

Introductory Courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.
ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, second half-year.

During the academic years 1889-1907, advanced and special courses have been given in:

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with application to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. Theory of Functions according to Cauchy, Riemann, and Weierstrass, with applications.

13. Weierstrass's Theory of Elliptic Functions.

14. Abelian Functions and Integrals.

15. Numerical Computations.

16. Theory of Quadratic Forms.

17. Analysis Situs, particularly the connectedness of surfaces and map-coloring.

18. Surfaces of the Third and Fourth Orders (analytically treated).

19. Plane Curves of the Third and Fourth Orders (analytically treated).

20. Klein's Icosahedron-Theory.

21. Elliptic Modular Functions.

22. Theta-Functions of Three and Four Variables.

23. Riemann's Theory of Hyperelliptic Integrals.

24. Symbolic Logic.

25. Twisted Curves and Developable Surfaces (torses).

26. Rational and Uniform Transformations of Curves and Surfaces.

27. Theory of Functions of a Real Variable.

28. Definite Integrals and Fourier's Series.

29. Ordinary Differential Equations, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's and Bessel's functions.

30. Partial Differential Equations, including Laplace's, Bessel's, and Lamé's functions.

31. Finite Differences and Probabilities.

32. Applications of the Infinitesimal Calculus to the Theory of Surfaces.

33. Simultaneous Equations, including Restricted Systems.

34. Theory of Transformation Groups.

35. The Application of Transformation Groups to Differential Equations.

36. Theory of Errors.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.[1] Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals are the following:

Acta mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American association for the advancement of science. Proceedings, 1848 to date. Complete.

American journal of mathematics. Baltimore, 1878 to date. Complete.

American mathematical Society.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

Amsterdam. Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Annali di matematica, pura ed applicata. Milano, 1889 to date.

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[1] For requirements see p. 52.

Annals of mathematics. 1884 to date. Complete.

Archiv der mathematik und physik. 1901 to date.

Berlin. Königlich-preussische akademie der wissenschaften. Mathematische und naturwissenschaftliche mittheilungen aus den sitzungsberichten. 1882-97. Complete.

Berliner mathematische gesellschaft. Sitzungsberichten. 1902 to date. Complete.

Bibliotheca mathematica. Stockholm, Berlin and Paris, 1884 to date. Complete.

Bologna, Istituto di. Reale accademia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1810.

Memorie. 1850 to date. Complete.

Boston. American academy of arts and sciences. Proceedings, 1878-95.

British association for the advancement of science. Report. 1831 to date. Complete.

Brussels. Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémoires des savants étrangers. 1889-90.

Bulletin des sciences, mathématiques et astronomiques. 1870 to date. Complete.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

Colorado, University of. Studies. 1902 to date. Complete.

Deutsche mathematiker vereinigung. Jahresbericht, Leipzig, 1890 to date. Complete.

Edinburgh philosophical journal. 1819-1826.

Fortschritte der mathematik, Jahrbuch über die. Berlin, 1868 to date. Complete.

France, Société mathématique de. Bulletin. Paris, 1873 to date. Complete.

Göttingen. Königliche gesellschaft der wissenschaften. Nachrichten von der k. gesellschaft der wissenschaften und der Georg-Augusts-universität. 1853 to date.

Haarlem. Hollandsche maatschappij der wetenschappen. Archives néerlandaises des sciences exactes et naturelles. 1866 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

Internationale mathematiker-kongress. Verhandlungen. 1897 to date. Complete.

Journal de mathématiques pures et appliquées. Paris, 1836 to date. Complete.

Journal für die reine und angewandte mathematik; gegründet von A. L. Crelle. Berlin, 1826 to date. Complete.

Leipzig. Königlich-sächsische gesellschaft der wissenschaften.

Berichte über die verhandlungen der mathematisch-physichen classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physichen classe. 1852 to date. Complete.

Liège. Société royale des sciences. Mémoires. 1843 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

London. Royal society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematische annalen. Leipzig, 1869 to date. Complete.

Messenger of mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Milan. Reale istituto lombardo di scienze e lettere.

Classe di scienze matematiche e naturali. Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

New York mathematical society. Bulletin. 1891-94. Complete.

Nouvelles annales de mathématiques. Paris, 1842 to date. Complete.

Paris. Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Paris. Annales scientifiques de l'école normale supèrieure. 1864 to date. Complete.

Paris. École polytechnique. Journal. 1794 to date. Complete.

Philosophical magazine. London, Edinburgh and Dublin, 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. London, 1857 to date. Complete.

Revue semestrielle des publications mathématiques, rédigée sous les auspices de la société mathématique d'Amsterdam, 1893 to date. Complete.

Vienna. Kaiserliche akademie der wissenschaften. Sitzungsberichte der mathematisch-naturwissenschaftlichen classe. 1889 to date.

Zeitschrift für mathematik und physik. Leipzig, 1856 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche unterricht. 1903 to date.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS

Professor Webster will deliver regularly, with a period of two years, the following cycle of unstarred courses. The starred courses have been given, or will be given, at irregular intervals. The lectures occupy from five to seven hours weekly.

1. Dynamics. General Principles, Canonical Equations, Methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

2a.* Figure and Motion of the Earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

3a.* Dynamics of Cyclic and Oscillatory Systems, with Applications to Theory of Electricity, Sound and Light.

3b.* The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

4. Electricity and Magnetism.

4a.* Recent Developments in Electrical Theory, Including the Theory of Lorentz.

5. Optics, Physical and Geometrical. Elastic and Electromagnetic Wave-theories.

5a.* Comparison of the Theories of the Ether.

6. Thermodynamics, Thermo- and Electro-Chemistry, Kinetic Theory of Gases, Radiation.

7. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Beltrami-Lorentz Equation, Telegrapher's Equation, Methods of Cauchy, Green, and Rie-

mann, Developments in Series, Legendre's, Laplace's, Bessel's and Lamé's Functions.

8.* Linear Differential Equations.

9.* Elliptic Functions, with certain physical applications.

10. Orthogonal Surfaces and Curvilinear Co-ordinates, and their applications.

The courses for the year 1907-08, will be 5-5a-6-7 (1, 2, 3, 4 have been given this year).

(The substance of courses 2, 3 a, and 4 is to be found in Dr. Webster's Treatise on the Theory of Electricity and Magnetism, Macmillan and Co., London and New York. That of courses 1, 2, 2 a, 3, 3 a is contained in his Treatise on Dynamics, B. G. Teubner, Leipzig.)

In addition to the above courses, there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures and for the presentation of summaries of important articles appearing in the journals.

A part of the work of the colloquium consists in the systematic presentation of certain classical researches, connected more or less with the lectures, in preparing which the students make use of the original sources of information, thus gaining much experience in methods of research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

In addition to the lectures announced above, advanced courses may occasionally be given on subjects not included in the list of starred courses.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will

be put at work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches, and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat or electricity, certain cases in hydrodynamics and sound, or in the theory of mag-

netic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "curl," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy and it is attempted, as far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The value of a sound knowledge of dynamics to the student of physics cannot be overestimated, and the course in dynamics forms the natural foundation for the remaining courses.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the stu-

dent Lamb's, Gibson's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

Requirements for the Doctor's Degree

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 7, which are intended to constitute the equivalent of five hours a week for one year. Course 7 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *dynamics* and Riemann-Weber's *Partielle Differentialgleichungen.*

Facilities

At the beginning of the year 1903-04 the Physical Department was moved from the rooms it formerly occupied in the main building to the unoccupied wing of what was formerly known as the chemical building, which was remodelled to accommodate the department. This affords convenient and commodious quarters separate from all other departments, and quite free from disturbance, the chemical laboratories being in the other wing separated by a tight partition. On the ground floor is a room extending across the end of the building, with windows on three sides, forty-five feet long by twenty-two feet wide, above which are three other similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables. The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The

engine and storage-battery room containing a high-speed steam-engine connected with the heating boiler and a kerosene engine on the same foundation, with the dynamo between, and seventy-five cells of storage-battery, furnishes the power supply. The storage-cells are conveniently arranged so that each one is accessible from each side, above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switch-boards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the work-shop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine lathes, jeweller's lathe and planer, and the third room a Rivett precision bench lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been here constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are also given for the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is intended to be used for optical purposes. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research,

besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Dr. Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermo-dynamics, and electricity, the number of which is continually increasing, and some of which are rarely found. Among these are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibb's and other thermo-dynamical surfaces.

The Library

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use.

The library of the Physical Department is large and carefully selected and, in mathematical physics particularly, may fairly be said to contain the best works. Among others may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchoff, Kelvin, Lorentz, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Tait, Young, Gauss, Fourier, Leplace, Cauchy, Foucault, Fresnel.

Potential Electricity and Magnetism. Riemann, Betti, Dirichlet, Mathieu, Somoff, Kirchoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Watson and Burbury, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, a set of the Travaux et Mémoires du Comité International de Poids et Mesures, and of the published memoirs of the Physikalisch-technische Reichsanstalt, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.
Annales de Chimie et de Physique.
Comptes Rendus.
Eclairage Electrique.
Journal of Physical Chemistry.
Nature.
Philosophical Magazine.
Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of the Royal Society.
Science.
Science Abstracts.
Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals:

American Journal of Science.
Annalen der Physik.
Beiblätter zu den Annalen der Physik.
Annales de Chemie et de Physique.
Comptes Rendus.
Eclairage Electrique.
Electrical World.
Electrician.
Elektrotechnische Zeitschrift.
Fortschritte der Physik.
Journal of Physical Chemistry.
Journal de Physique.
Nature.
Il Nuovo Cimento.
Philosophical Magazine.

Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of the Royal Society.
Science.
Science Abstracts.
Verhandlungen der Deutschen Physikalischen Gesellschaft.
Zeitschrift für Instrumentenkunde.

III

CHEMISTRY

The courses in chemistry leading to the degree of Master of Arts are intended to provide work of an advanced nature which shall supplement the elementary work of the undergraduate in such a way as to give the student a broader and more comprehensive view of the subject. At the same time it is intended to encourage in the student a desire for independent investigation, and to offer opportunity for doing specialized work. The work in its general nature falls into the two following groups:

I. Courses of lectures and laboratory work designed to increase the student's general knowledge of chemistry, including such subjects as the chemistry of the rare elements, usually not treated in elementary courses; methods of making pure preparations; analytical methods, qualitative and quantitative; electro-chemistry; optical and photo-chemistry and other special branches of physical chemistry; organic preparations and special methods of organic analysis.

II. Research courses in which the knowledge already acquired is applied to the acquisition of further knowledge through the agency of original investigation.

The laboratory work is much more individual in character than is possible in elementary work. The student is encouraged to undertake that line of work in which he is especially interested, and opportunity is offered to take up any special subject desired, under the direc-

tion of the instructor. The laboratory work will thus be varied to suit the needs of the individual and will partake more of the nature of independent investigation than is possible with the prescribed work of elementary courses. This work will be supplemented by lectures dealing with the theoretical aspects of the subject, and accompanied by general reading and seminary work.

The exact nature and amount of work required for the degree of Master of Arts will be determined individually. In general, it will be work of advanced grade to occupy most of the student's time for one year. This work may be all in this department, or it may be partially in one or more other departments, with the approval of the instructors in those departments.

The lecture course will be varied from year to year to meet the requirements of students. For 1907-1908 the following courses will be offered by Dr. Merigold:

Advanced Inorganic Chemistry. Lectures and laboratory work dealing with special analytical methods; sources of error; the chemistry of the rare elements; preparation of pure inorganic compounds; optical chemistry, including the theory and application of the polariscope, refractometer, spectroscope, and microscope as aids to chemical work. Special consideration will be given in the lectures to the theoretical side of these subjects. The laboratory work may be varied to include any subject along these lines in which the student may be interested.

Electro-Chemistry. Lectures and laboratory work dealing with the modern theories of electro-chemical action, including electrolytic action in aqueous and non-aqueous solutions and fused salts; the electrolytic dissociation theory and its application; the laws governing the chemical production of current and electromotive force. Attention will also be given to the more important applications to analytical and synthetical methods, and to technical processes involving electro-chemical action.

An elementary knowledge of the general principles of physical

chemistry, electricity and electrical measurements, is a prerequisite for this course.

PHYSICAL CHEMISTRY. Lectures and laboratory work. A general elementary knowledge of the subject is presupposed.

SEMINARY. Reports and discussion of contemporaneous work appearing in current journals, and presentation of special topics.

RESEARCH. Students may take up any line of chemical investigation for which previous work has fitted them.

Candidates for the degree who are specializing in chemistry, may, if desired, devote all their time to any one of the subjects outlined above, with the exception of the seminary work, which is required of all who make chemistry a major subject.

While a certain amount of laboratory work illustrative of the lecture work is given, it is expected that candidates for the Master's degree will devote the major portion of their laboratory work to some line of original investigation.

Students for whom chemistry is a minor subject may take up any course for which their previous training has prepared them.

In the laboratory work students are expected to become familiar with the literature bearing upon their subject. Consequently a reading knowledge of French and German is essential.

In special cases, when satisfactory reasons exist, either the lectures or the laboratory work of the lecture courses may be taken separately.

IV.

BIOLOGY

Programme for Year 1907–1908

Dr. Hodge will offer the following courses:

I. Dynamic Biology and General Physiology. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. Among others, the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. Biological Education. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures, to be arranged for by consultation during the year.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year, history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1907–1908 will be the second year of the cycle.

Neurology

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows:

IV. Comparative Study of Nervous Systems and Sense Organs. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the differing degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or will be arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. The Human Nervous System and Sense Organs. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.[1]

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows:

VI. Practical Histology. The course will be a laboratory course, with such lectures, directions and conferences as

[1] For elementary courses in special physiology, histology and hygiene, refer to announcement of biological courses in the Collegiate Department.

may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

Experimental Work

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attainments. A course in biology such as is given in our best colleges and State universities is sufficient to enable students to begin work here.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost

price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these is to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

The Journal Club meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V.

ANTHROPOLOGY

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. GENERAL ANTHROPOLOGY, embracing: (a) HISTORY, scope and relations of the science. (b) PHYSICAL ANTHROPOLOGY; problems, investigations, results, laboratory work. (c) ETHNOGRAPHY; races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origin and development of the arts and sciences, institutions, mythology, folk-lore, religions. (e) LINGUISTICS; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (f) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY: physical and mental, ethnic morals. (g) HISTORICAL AND ARCHÆOLOGICAL; primitive man and primitive culture, the precursors of man.

B. SPECIAL COURSES upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly the characteristics of the primitive races and their rôle in human history. The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environmentin the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions;

the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their Relations to Human Evolution; the Negro in Africa and in America; the American Indian.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI

PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord; senses, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-time, Memory, Attention, Association, Will, Feelings, etc. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Comparative and Genetic Psychology. Observation and experiments upon the mental processes of lower animals, including both microscopical and larger forms, and especially (when practicable) the observation of dawning intelligence during animal infancy; questions of instinct and psychical heredity; and the parts of the general field common to biology and psychology. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies, and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and Nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles's lectures and clinic.

V. Anthropological Psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive

Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

The Psychological Laboratory consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Lecture Room; 2, Large Dark Room; 3, Seminary and Departmental Library; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 6, 7 and 8, Rooms for demonstration and research; 9, Shop; 10, Photographic Dark Room; 11, Room for the keeping of animals and for Comparative Psychology. In floor space and favorable situation the Laboratory leaves little to be desired.

The department is well supplied with apparatus for both demonstration and research, and has access also to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the Library is full on Experimental and Physiological Psychology, and upon The Psychology of Religion and the Study of Children. The section on criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of the most important are upon the shelves of the library.

The following courses are announced for the academic year 1907-1908.

Dr. Hall's Courses

Dr. G. Stanley Hall will give the following courses:

I. The History of Ancient Philosophy beginning with the Greeks and coming down to the end of the Alexandrian and the Patristic Period. One hour a week.

II. Infancy and Childhood. A systematic and comprehensive survey of children from birth to adolescence, with references to and demonstrations of the literature and with incidental applications of results of education. One or two hours a week.

III. Psychological Evolution in Animals and Man. The genesis of animal instinct and the natural history of man down to the Prehistoric Period. This course will treat of the genealogy and natural history of the human race, beginning with the upright position and including primitive industries, myths, customs and life, with archeological references. One hour a week.

IV. Religious Psychology and the Psychology of Jesus. One hour a week.

V. The Pedagogy of different topics of education in the primary and grammar school, with some references to college and university work. One hour a week.

VI. Seminary, at his home, three hours every Monday evening throughout the year. Papers read and criticised by students.

VII. Research with individuals on special subjects.

Dr. Sanford's Courses

The following courses or their equivalents will be given by Dr. Sanford:

1. *Comparative Psychology. The Evolution of mind in the race and the individual.* General theory of evolution; review of the facts of psychogenesis; discussion of applications to human mental progress. Three hours a week, first half-year.

2. *Theory and Practice of Psychological Measurements.* Mathematical foundations of the statistical methods in common use in experimental psychology. The psychophysical methods. Means of establishing correlation. Informal lectures with practice in psychological calculations. Three hours a week, second half-year.

3. *Psychological Seminary.* Reports and discussions on topics of current psychological interest. The work in the Seminary is informal and is varied to suit the needs of those attending it. One hour a week, throughout the year.

4. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. Six hours a week, throughout the year.

5. *Research.* Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr. Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

Psychiatry

Dr. Cowles, former head of the McLean Hospital at Waverley, Mass., lecturer on psychiatry, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital.

Dr. Cowles's course for the year 1906-1907 has included the following topics:

1. The dependence of psychiatry upon psychology as essentially the study of mental function and its disorders in the domain of physiology.

2. The relation of psychology and psychiatry to the prevailing

morphological conceptions of general medicine and the difficulty of harmonizing them.

3. Mental physiology; imperative ideas, obsessions, and psychological automatism.

4. The mental symptoms of nervous exhaustion. Forms of mental diseases—(mental symptoms essentially constituting the disease-forms).

5 and 6. The "symptomatic and functional" psychoses (not tending to dementia). The phases of "melancholia" and "mania;" "confusional insanity."

7 and 8. The deteriorating psychoses (tending to dementia), dementia præcox (hebephrenic, katatonic, and paranoid forms), paresis, senile dementia.

9. The chronic psychoses (not tending to grave dementia). Involution psychoses. Primary delusional insanity,—paranoia.

10. Insanities from mental defect. Imbecility, idiocy, moral insanity.

Dr. Cowles's lectures are open without fee

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is $5.00.

VII

PEDAGOGY

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

I. (a) Child Study. (b) Pedagogical Psychology. (c) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organization of Schools in Different Countries. (b) The Teaching Profession. (c) Motor Education, including manual training, physical education, etc. (d) Moral and Religious Education. (e) Ideals.

The courses in Pedagogy for 1907-1908 will be as follows:

DR. BURNHAM'S COURSES

A. THE HYGIENE OF THE SCHOOL CHILD. This course is supplementary to the course on the hygiene of Instruction given in 1904-05. Some of the more important chapters in modern school hygiene will be considered, including such topics as: The conditions that determine growth and development. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. Hygiene of memory, of attention, and of feeling. The hygienic aspect of some psychological studies. *Once a week, Saturdays, throughout the year.*

B. EXPERIMENTAL PEDAGOGY. A résumé of important results of recent experimental studies. The general point of view of experimental pedagogy. The contribution of experimental psychology to pedagogy. Experiments on the learning process, the acquisition of motor habits, the acquisition of technical skill, telegraphy, piano-playing, etc. Experimental studies of memory and of testimony. Experimental studies in reading, arithmetic, writing, etc. Tests of intelligence. The significance and value of experimental studies in pedagogy. Practical results. *One hour a week, half a year.*

C. PRINCIPLES OF EDUCATION. This course treats certain fundamental educational principles and involves also a study of several important chapters in the history of education, with a brief account of a few representative educational systems. Such topics as the following will be included: Educational ideals. The dominant aim at different stages of development. The correlation of educational forces. The family and education. The church and education. State aid and control. The field of scientific study in education. Antithetic educational principles. The history of nature versus convention in Education. Rousseau. Pestalozzi as "pedagogical socialist." Modern

Social-Pædagogik. Present problems and tendencies. *One hour a week, half a year.*

D. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to some phase of the history of education. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week throughout the year.*

President G. Stanley Hall's Course

The pedagogy of different topics in primary and secondary education with demonstrations of elementary text-books, apparatus and various other illustrative material.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of Educational Literature, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. General.
2. History of Education.
3. Educational Systems.
4. The Theory of Education and Special School Subjects.
5. Educational Psychology.
6. Child Study.
7. School Hygiene and Physical Education.
8. Text-Books.
9. Miscellaneous.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of $20.

VIII.

ECONOMICS AND SOCIOLOGY

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, and each year such courses will

be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology. (See announcement in Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1907–1908 the following courses are offered.

By Professor Wright

3. Theory and Use of Statistics.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. Labor Problems.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. Seminary.

By Dr. Bushee

5. Theory of Sociology. (See announcement in Collegiate Department.)

And one or more of the following courses:

1. Economic Theory during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. Literature of Sociology. In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumplowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. Socialism and Communism. This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. Seminary in Economics and Sociology. Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX.

HISTORY

Dr. Blakeslee will offer the following courses:

1. Contemporary History.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department wlll give particular attention are those which have a real importance at the present day. The students may gain the necessary information in the various subjects from the lectures and from extended reading; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

The subjects recently studied have been: Russia,—political, social, and constitutional development, with emphasis upon the causes and the events of the present revolution; the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment; the history of the American Negro and the present Negro problem; the Awakening of China,—its international relations and recent social and cultural development; and the Government of Dependence, including such topics as Race Psychology and the problems of the social, economic, and religious education of primitive peoples.

Each year one of the following courses will probably also be given:

2. International Law.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite

cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history aad present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. English History—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. The History of the Christian Church.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. Economic History of Europe.

The aim of the course will be to give a general account of the rise and development of the leading economic and social institu-

tions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students of economics.

6. United States History. Different subjects for this course may be taken in succee ding years such as: Colonial Possessions of the United States including a sketch of the history of the Dutch, Spanish and Portuguese colonies, and a comparison of their problems, successes and failures with those of the United States in the Philippines and Porto Rico; the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850; and the students will be expected to present reports upon topics assigned by the instructor; these reports will then form the basis for a critical discussion.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex-officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE

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The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 42,000 bound volumes and 1,500 pamphlets, and the reading-room receives over 200 journals.

The books are grouped as follows:

A Works of General Reference
B Journals
C Mathematics
C D Math.-Physics
D Physics
E Chemistry
F Biology, Zoology, Botany, Physiology, Neurology
G Geography
H Pathology
I Psychology
J Philosophy
K Religious Psychology
L Biography
M Anthropology
N Education
O General Science
P History
Q Law
R Political and Social Science
S English
T Modern Languages
U Classics
W Practical Arts
X Library Science
Y Art
Z Manuscripts

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 240 volumes were borrowed from, and 162 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

VOL. 1

No 1. Wilson, Louis N.
Bibliography of the Published Writings of President G. Stanley Hall. Oct. 1903.

No. 2. Wilson, Louis N.
Bibliography of Child Study for the Year 1902. Jan. 1904.

No. 3. Proceedings and Addresses at the Public Opening of the Library Building of Clark University, Thursday, January 14, 1904. Apr. 1904.

No. 4. Wilson, Louis N.
Bibliography of Child Study for the Year 1903. July 1904.

No. 5. Wilson, Louis N.
Preparing Manuscript for the Press. Jan. 1905.

No. 6. Founder's Day, Clark University. Apr. 1905.

No. 7. Wilson Louis N.
Bibliography of Child Study for the Year 1904. July 1905.

No. 8. de Perott, Joseph
The Probable Source of the Plot of Shakespeare's Tempest. Oct. 1905.

No. 9. Proceedings and Addresses at the Public Opening of the Art Department of Clark University. Dec. 1905.

VOL. 2

No. 1. List of Books and Pictures in the Clark Memorial Collection. July 1906.

No. 2. Wilson, Louis N.
Bibliography of Child Study for the Year 1905. Oct. 1906.

The department of religious psychology, established within the past two years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which Volume 2 is nearing completion.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 590 newspapers and magazines and 153,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of over 10,000 volumes is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

> "the sum of $100,000 as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions, but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1. A Curator and Custodian of them have been appointed by the Board (see page 89) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no instructor, Docent, or Fellow shall enter upon other engagements outside

his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make at

the October meeting an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report if approved shall be filed and preserved.

DEGREES CONFERRED

On June 19, 1906, the University conferred degrees upon the following persons:

MASTER OF ARTS

Albert H. N. Baron
Dissertation: The treatment of juvenile offenders in Worcester, Massachusetts.

Robert Irving Bramhall
Dissertation: 1. The origin and growth of the English manor. 2. The Congo in American diplomacy.

Frederick Norton Cooke, Jr.
Dissertation: A study of causes of poverty in Worcester, Massachusetts.

George Leonard Drowne
Dissertation: The essential elements of poetry.

Arthur Howard Estabrook
Dissertation: The present status of the English sparrow problem in America.

Burton Noble Gates
Dissertation: Cellular structures in the peach.

Elmer Adna Harrington
Dissertation: Quantitative observations on the vibration of a tuning-fork.

William Harold Keith
Dissertation: The development of Russia in Asia: its past and future.

Chauncey Allan Lyford
Dissertation: A study of the hydrolytic decomposition products of bovine hæmoglobin.

Harry Schürmann
Dissertation: Dramatic characteristics of Richard Wagner's trilogy "Der Ring des Niebelungen."

Reginald Webster Webb
Dissertation: The psychological novel.

DOCTOR OF PHILOSOPHY

Frank Kelton Bailey
Dissertation: On the latent heat of recalescence in iron and steel.

William Frederick Book
Dissertation: The acquisition of skill in typewriting.

Alvin Borgquist
Dissertation: Crying.
American Journal of Psychology, April, 1906, Vol. 17, pp. 149-205.

Alfred A. Cleveland
Dissertation: The psychology of chess and of learning to play it.

Frederick N. Duncan
Dissertation: A comparative study of contractile tissue.

Arnold Lucius Gesell
Dissertation: Jealousy.
American Journal of Psychology, October, 1906, Vol. 17, pp. 437-496.

David Gibbs
Dissertation: The pedagogy of geography.
Pedagogical Seminary, March, 1907, Vol. 14, pp. 39.

Albert Wellman Hitchcock
Dissertation: The psychology of Jesus.

James Ralph Jewell
Dissertation: Agricultural education.

Toshi-Yasu Kuma
Dissertation: A study of school legislation in the United States.

George Edmund Myers
Dissertation: Moral training in the school.
Pedagogical Seminary, December, 1906, Vol. 13, pp. 409-460.

James P. Porter

Dissertation: The habits, instincts, and mental powers of spiders, genera argiope and epeira.

American Journal of Psychology, July, 1906, Vol. 17, pp. 306-357.

James Theron Rood

Dissertation: Quantitative investigations on the transmission of sound by the telephone.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements:

Eugene W. Bohannon
A. Caswell Ellis

PUBLICATIONS RELATING TO THE UNIVERSITY

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1892, and 1893, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration, 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

The American Journal of Psychology. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July

and October, Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price, $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers —issued in March, June, September and December. Price, $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

THE AMERICAN JOURNAL OF RELIGIOUS PSYCHOLOGY AND EDUCATION. This journal was begun in May, 1904, and three numbers constitute a volume. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and prints original articles. Each number contains about 100 pages. Price, $3.50 per volume, $1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a vertical green stripe between two white ones.

Clark University
in the City of Worcester
Massachusetts

Register and Twentieth Official Announcement

1908

BOARD OF TRUSTEES

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CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER

AND

Twentieth Official Announcement

WORCESTER, MASSACHUSETTS
PUBLISHED FOR THE UNIVERSITY
March, 1908

CALENDAR 1908-1909

1908			
MAR.	30	Monday	Spring Recess
APRIL	4	Saturday	
APRIL	20	Monday	Patriot's Day
MAY	30	Saturday	Memorial Day
JUNE	18	Thursday	Nineteenth academic year closes

Summer Vacation of 14 Weeks

SEPT.	24	Thursday	Twentieth academic year begins
NOV.	26	Thursday	Thanksgiving Day
DEC.	25	Friday	Christmas Recess
1909			
JAN.	2	Saturday	
FEB.	1	Monday	Founder's Day*
FEB.	22	Monday	Washington's Birthday
APRIL	5	Monday	Spring Recess
APRIL	10	Saturday	
APRIL	19	Monday	Patriot's Day
MAY	31	Monday	Memorial Day
JUNE	17	Thursday	Twentieth academic year closes

*Not a holiday

MEMBERS

STAFF

G. STANLEY HALL, PH. D., LL. D. 94 Woodland St.
President of the University and Professor of Psychology

A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888; Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D.
Professor of Mathematics 17 Hammond St.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark College, 1902-07. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D. 24 Richards St.
Professor of Experimental and Comparative Psychology

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903-07; Director of Psychological Laboratories.

ARTHUR G. WEBSTER, PH. D., D. Sc.
Professor of Physics 66 West St.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; Professor of Physics, Clark College, 1902-07; Director of Physical Laboratories; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH. D.
Professor of Mathematics 65 West St.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D. 96 Woodland St.
Professor of Statistics and Social Economics

President, Clark College, 1902– .

CLIFTON F. HODGE, PH. D.
Professor of Biology 3 Charlotte St.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902– .

WILLIAM H. BURNHAM, PH. D.
Professor of Pedagogy 100 Chatham St.

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900-1906.

ALEXANDER F. CHAMBERLAIN, PH. D.
Assistant Professor of Anthropology 19 Baker St.

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian;* Editor, *Journal of American Folk-Lore;* Corresponding Member O Instituto do Coimbra, Portugal; Member of the American Antiquarian Society.

MARTIN A. ROSANOFF, PH. B. 2 Grand St.
Assistant Professor of Chemistry

Ph. B., New York University, 1895; Student, University of Berlin, 1895-96; University of Paris, 1896-98; Research Fellow, New York University, 1899-1900; Instructor in Theoretical Chemistry, New York University, 1904-05; Assistant Professor of Chemistry, 1905-07; Assistant Professor of Organic Chemistry, Clark College, 1907– ; Director of Chemical Laboratories.

JOSEPH DE PEROTT
Lecturer in Mathematics 5 Hawthorn St.

Student, Universities of Paris and Berlin, 1877-80.

LOUIS N. WILSON, Litt. D. 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

FREDERICK A. BUSHEE, PH. D. 45 Hollywood St.
Instructor in Economics and Sociology

Litt. B., Dartmouth College, 1894; A. M., Harvard University, 1898; Ph. D., 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; College Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Clark College, 1902-03; Assistant Professor of Economics, 1903– .

BENJAMIN S. MERIGOLD, PH. D.
Instructor in Chemistry — 59 Chatham St.

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard University, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Clark College, 1903– .

GEORGE H. BLAKESLEE, PH. D.
Instructor in History — 940 Main St.

A. B., Wesleyan University, 1893; A. M., Harvard University, 1899; Ph. D., 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Clark College, 1903-04; Assistant Professor, 1904– .

ANNUAL APPOINTMENTS

EDWARD COWLES, M. D., LL. D.
Non-Resident Lecturer on Psychiatry — Boston, Mass.

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886- ; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888–; LL. D., Dartmouth College, 1890.

HONORARY FELLOWS

ALVIN BORGQUIST, PH. D.
Honorary Fellow in Psychology — 20 Curtis St.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford Jr. University, January 1898-May 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05; Research Assistant to Professor Sanford, 1905-06; Ph. D., Clark University, 1906; Instructor in Psychology, Fairmount College, Kansas, 1906-07.

ORIS P. DELLINGER, PH. D.
Honorary Fellow in Biology — 101 May St.

Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-06; Ph. D., Clark University, 1907; Assistant in Biology, Clark College, 1904-07; Instructor, 1907– .

CHARLES WILSON EASLEY, A. M.
Honorary Fellow in Chemistry — 87 Woodland St.

A. B., Dickinson College, 1897; A. M., 1899; Scholar in Physics, Clark University, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Honorary Fellow in Chemistry, 1906-07; Instructor in Chemistry, Clark College, 1902– .

CEPHAS GUILLET, PH. D., Toronto, Canada
Honorary Fellow in Psychology 1 Agawam St.

B. A., Victoria University, 1887; Student at Law, Osgood Hall, Toronto, 1894-95; Scholar in Psychology, Clark University, 1895-96; Fellow, 1896-98; Ph. D., Clark University, 1898.

JOHN CHARLES HUBBARD, PH. D.
Honorary Fellow in Physics 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02; Fellow, 1902-04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904-05; Assistant Professor of Physics, New York University, 1905-06; Assistant Pro fessor of Physics, Clark College, 1906– .

HIKOZO KAKISE, Oitaken, Japan
Research Assistant to Professor Sanford 76 Woodland St.

Graduate, Tokio Imperial University, 1901; Assistant in Psychology, *ibid.*, 1902-06; Fellow in Psychology, Clark University, 1906-07.

CAREY EYSTER MELVILLE, A. B.
Honorary Fellow in Mathematics 101 May St.

A. B., Northwestern University, 1901, Fellow in Mathematics, *ibid.*, 1901-02; Graduate Student in Mathematics, Johns Hopkins University, 1902-03; Instructor in Mathematics, Case School of Applied Science, 1903-06; Honorary Fellow in Mathematics, Clark University, 1906-07; Assistant in Mathematics, Clark College, 1906– .

TADASU MISAWA, PH. D., Takanabe, Japan
Honorary Fellow in Psychology 44 Woodland St.

Graduate, Tokio Imperial University, 1904; Fellow in Psychology, Clark University, 1905-07; Ph. D., Clark University, 1907.

JOSIAH MORSE, PH. D.
Honorary Fellow in Psychology 40 Wellington St.

A. B., Richmond College, 1899; A. M., 1900; Scholar in Psychology, Clark University, 1900-01; Fellow, 1901-04; Honorary Fellow and Assistant, 1904-05; Honorary Fellow, 1906-07; Ph. D., Clark University, 1905; Instructor in Psychology and Education, University of Texas, 1905-06.

CAROLINE A. OSBORNE, A. M.
Honorary Fellow in Biology 87 Woodland St.

M. D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904- ; Student in Biology, Clark University, 1901-05; Fellow, 1905-06; Honorary Fellow, 1906-07; A. M., Clark University, 1997.

JAMES P. PORTER, PH. D.
Honorary Fellow in Psychology 938 Main St.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of Work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-07; Ph. D., Clark University, 1906; Instructor in Psychology, Clark College, 1903-07; Assistant Professor, 1907– .

THOMAS LANSING PORTER, B. S., Evanston, Illinois
Research Assistant to Professor Webster 18 Gates St.

B. S., Northwestern University, 1907; Laboratory Assistant in Physics *ibid.*, 1906-07.

W. F. ROBIE, M. D., Baldwinville, Massachusetts
Honorary Fellow in Psychology and Biology

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893 Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902-07; Pine Terrace Sanitarium, 1907- ; Student in Psychology and Biology, Clark University, 1904-05; Honorary Fellow, 1905-07.

THEODATE L. SMITH, PH. D.
Research Assistant to President Hall 23 Maywood St.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, October 1904-February 1905; Berlin University, April-August, 1905; Research Assistant to President Hall, Clark University, 1905- .

WILLIAM E. STORY, JR., PH. D.
Research Assistant to Professor Webster 17 Hammond St.

A. B., Harvard University, 1904; Scholar in Physics, Clark University 1904-05; Fellow, 1905-07; Ph. D., Clark University, 1907.

AMY ELIZA TANNER, PH. D., Faribault, Minnesota
Honorary Fellow in Psychology 4 Woodbine St.

A. B., University of Michigan, 1893; Scholar, University of Chicago, 1894-95; Fellow, 1905-08; Ph. D., University of Chicago, 1898; Associate in Philosophy, *ibid.*, 1898-1902; Professor of Philosophy, Wilson College, 1903-07.

FELLOWS AND SCHOLARS

NORMAN HERBERT ANNING, M. A., Oxmead, Canada
Fellow in Mathematics 8 Loudon St.

B. A., Queen's University, Kingston, Canada, 1905; M. A., 1906; Tutor in Physics, *ibid.*, 1903-04; Tutor in Mathematics, 1904-05; Fellow in Mathematics, Clark University, 1906-07.

JOHN FRANKLIN BOBBITT, A. B.
Fellow in Pedagogy 15 Piedmont St.

A. B., Indiana University, 1901; Principal of Normal School, Mindanao, 1902-03; Instructor in Educational Methods, Manila Normal School, 1903-07

JOHANNES BROENE, A. M., Grand Rapids, Michigan
Fellow in Psychology 78 Florence St.

Pd. B., Valparaiso University, 1906; Scholar in Psychology, Clark University, 1906-07; A. M., Clark University, 1907.

ERNEST WILLIAM COFFIN, B. A., Charlottetown, Canada
Fellow in Psychology 78 Florence St.

B. A., Dalhousie University, 1902; Fellow in Psychology, Clark University, 1905-07.

HERBERT BURNHAM DAVIS, A. B.
Fellow in Psychology 54 Florence St.

A. B., Bates College, 1890; Scholar in Psychology, Clark University, 1906-07.

LOUISE ELLISON, A. M., St. Louis, Missouri
Fellow in Psychology 2 Woodbine St.

A. B., Washington University, 1906; Scholar in Psychology, Clark University, 1906-07; A. M., Clark University, 1907.

GORDON SCOTT FULCHER, M. S., Evanston, Illinois
Fellow in Physics 17 Oread Place

B. S., Northwestern University, 1905; M. S., 1906; Fellow in Physics, *ibid.*, 1905-06; Research Assistant to Professor Webster, Clark University, 1906-07.

WILLIS L. GARD, A. B., Elkhart, Indiana
Fellow in Psychology 3 Charlotte St.

A. B., Indiana University, 1896; Fellow in Psychology, Clark University 1906-07.

JAMES WILLIAM HARRIS, A. B., Lexington, Kentucky
Fellow in Psychology 78 Florence St.

A. B., Union College, Barbourville, Ky., 1901; Scholar in Psychology, Clark University, 1905-06; Fellow, 1906-07.

EUCLID HELIE, A. B., Grand Ligne, Quebec
Fellow in Psychology 5 Lowell St.

A. B., McMaster University, Toronto, Canada, 1905; Scholar in Psychology, Clark University, 1905-06; Fellow, 1906-07.

KYUGORO ISHIZAWA, A. M., Hobara, Japan
Fellow in Economics 46 Woodland St.

Graduate, Waseda University, 1898, LL. B., Chyuo University, 1900; A. M., State University of Iowa, 1904; A. M., University of Wisconsin, 1907.

JUNICHIRO KINOSHITA, A. M., Tokio, Japan
Fellow in Economics 46 Woodland St.

Graduate, Doshisha College, 1892; Meiji University (Law), 1899; A. M. Yale University, 1907.

OLAF K. LIE, Richmond, Massachusetts
Fellow in Mathematics 242 Chandler St.

Graduate, Cadet-School, Kristiania, 1884; Fellow in Mathematics, Clark University, 1905-07.

C. ALLAN LYFORD, A. M.
Fellow in Chemistry 87 Woodland St.

B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Scholar in Chemistry, 1905-06; A. M., Clark University, 1906; Honorary Scholar, 1906-07; Assistant in Biology and Chemistry, Clark College, 1904-05; Assistant in Chemistry, 1905-07; Assistant in Geology, Feb. 1908– .

MAURICE WALTER MEYERHARDT
Fellow in Psychology 5 Clayton St.

Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-07.

NEWTON MILLER, A. M., Thorntown, Indiana
Fellow in Biology 78 Florence St.

A. B., Indiana University, 1905; A. M., 1906; Fellow in Biology, Clark University, 1906-07.

GEORGE ORDAHL, A. M., Eugene, Oregon
Fellow in Psychology — 81 Florence St.

B. S., Valparaiso College, 1899; A. B., University of Oregon, 1905; A. M., 1906; Fellow in Pedagogy, Clark University, 1906-07.

WILLIAM L. PRAGER, M. S., New York, New York
Fellow in Chemistry — 1 Benefit St.

B. S., College of the City of New York, 1900; M. S., New York University, 1904; Tutor in Mathematics, College of the City of New York, 1902-1907; Tutor in Chemistry, *ibid.*, 1907– .

EUGENE C. ROWE, A. B., Mt. Pleasant, Michigan
Fellow in Psychology — 80 Woodland St.

A. B., Olivet College, 1897; Head of Department of Psychology and Education, State Normal School, Mt. Pleasant, Mich., 1901– .

HERMON L. SLOBIN, A. B.
Fellow in Mathematics — 3 Blake St.

A. B., Clark College, 1905; Scholar in Mathematics, Clark University, 1905-06; Fellow, 1906-07.

JUN WATANABE, A. M., Tokio, Japan
Fellow in Economics — 14 Lowell St.

Graduate, Keiogizuku (College) University, 1905; Scholar in Economics, Clark University, 1906-07; A. M., Clark University, 1907.

EDWARD E. WEAVER, A. M., Catonsville, Maryland
Fellow in Psychology — 6 Hancock St.

A. B., University of Wooster, 1885; A. M., Princeton University, 1889; Graduate, Princeton Theological Seminary, 1889.

JESSE HAYES WHITE, A. M., Alamo, Indiana
Fellow in Psychology — 18 Gates St.

A. B., Indiana University, 1903; A. M., 1904; Assistant in Experimental Psychology, *ibid.*, 1903-04; Fellow in Psychology, Clark University, 1906-07.

EDWARD M. ARNOS, B. S., Archbold, Ohio
Scholar in Economics — 9 Gates St.

B. S., Lima College, 1907.

CHARLES W. BACON, A. M., North Oxford, Massachusetts
Scholar in Chemistry

A. B., Clark College, 1906; Scholar in Chemistry, Clark University, 1906-07; A. M., Clark University, 1907; Assistant in Chemistry, Clark College, 1907– .

WILLIAM JAMES BEESON, M. S., Jacksonville, Alabama
Scholar in Psychology — 44 Abbott St.

B. S., Alabama Polytechnic Institute, 1896; M. S., 1897; Principal of State Agricultural School, Blountsville, Ala., 1897-99; Professor of English and History, State Normal School, Jacksonville, Ala., 1899-1905; Meridian (Miss.) Male College, 1905-06.

FLOYD E. CHIDESTER, Ph. B., Newark Valley, New York
Scholar in Biology — 24 Beaver St.

Ph. B., Syracuse University, 1907; Assistant in Biology, *ibid.*, 1906-07.

CHARLES W. COBB, A. M., Newton Centre, Massachusetts
Scholar in Mathematics — 21 Shirley St.

A. B., Amherst College, 1897; A. M., 1901; Graduate Student in Psychology, Amherst College, 1897-98; Science of Education, Columbia and New York Universities, 1904-05.

ELNORA WHITMAN CURTIS, A. B.
Scholar in Psychology — Burncoat St.

A. B., Smith College, 1892.

ROLLAND RAWSON GREENWOOD, A. B.
Scholar in Psychology — 21 Merrick St.

A. B., Clark College, 1907.

SAKYO KANDA, Tokyo, Japan
Scholar in Psychology — 44 Woodland St.

Graduate, Kansei Gakuin, 1900.

FRANCIS P. McNAMARA, A. B.
Scholar in Psychology — 5 Suffield St.

A. B., College of the Holy Cross, 1907.

WILLIAM J. MONTGOMERY, A. B.
Scholar in Mathematics — 14 Lewis St.

A. B., Clark College, 1907.

RAYMOND KURTZ MORLEY, A. M.
Scholar in Mathematics — 46 Abbott St.

A. B. and A. M., Tufts College, 1904; Instructor in Mathematics, University of Maine, 1904-1907.

MARGARET MORSE, A. B., Amherst, Massachusetts
Scholar in Biology — 23 Maywood St.

A. B., Mount Holyoke College, 1906.

JOHN A. MUNSON, A. M.
Scholar in Psychology — 89 Summer St.

A. B., Central University of Iowa, 1891; A. M., University of Michigan, 1894; Instructor in Modern Languages, Central University of Iowa, 1890-93; Vincennes University, 1895-96; Syracuse University, 1903; Massachusetts Agricultural College, Feb., 1908– .

JAMES A. RUSSELL, A. B.
Scholar in Pedagogy — 3 Taylor St.

A. B., College of the Holy Cross, 1907.

WILLIAM G. SIDDELL, A. B.
Scholar in Psychology — 24 Beaver St.

A. B., Syracuse University, 1902; Special Student in Psychology, Clark University, 1906-07.

GEORGE HENRY STEVES, A. B., Onsted, Michigan
Scholar in Psychology — 24 Beaver St.

A. B., University of Michigan, 1905.

EDITH M. WALLACE, A. B., Nashua, New Hampshire
Scholar in Biology — 23 Maywood St.

A. B., Mount Holyoke College, 1903; Instructor in Biology, Western College for Women, Ohio, 1904-06.

SPECIAL STUDENTS

JOHN MERRICK BEMIS, M. D.
Student in Psychiatry — Herbert Hall Hospital

M. D., University of Vermont, 1893.

WINIFRED S. BIVIN
Student in Psychology — 15 Charlotte St.

ROBERT JOHN FLOODY, S. T. B.
Student in Psychology — 43 Endicott St.

Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-06; Honorary Scholar, 1906-07.

NELLIE MANN OPDALE, Marlboro, Massachusetts
Student in Psychology

EDWARD B. SAUNDERS, A. B., Fitchburg, Massachusetts
Student in Psychology

B. D., St. Lawrence University, 1900; A. B., 1904; Special Student in Psychology, Clark University, 1906-07.

NORA JENNINGS SWEENEY
Student in Psychiatry — Herbert Hall Hospital

HENRY BRADFORD WASHBURN, B. D.
Student in Psychology — 42 Elm St.

A. B., Harvard University, 1891; B. D., Episcopal Theological School, Cambridge, 1894; Temporary Instructor in Church History, *ibid.*, 1901-02.

INMAN L. WILLCOX, A. M.
Student in Philosophy — 138 Elm St.

A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-07.

ATTENDANTS UPON SATURDAY COURSES

O. H. ADAMS	Leicester
OLIVER R. COOK	Worcester
MINNIE E. DOHERTY	Worcester
G. MILTON FISHER	Westboro
JOHN M. GALLAGHER	Worcester
ALICE LOUISE HARRIS	Worcester
DOROTHY D. KEYES	Worcester

MAURICE J. LACEY	Worcester
BIEYAO TSANCHI LEE	Worcester
ANNIE P. PURDY	Dodge
HELEN NILES ROWE	Worcester
ETTA SINSABAUGH	Leicester

FLORENCE CHANDLER 52 Woodland St.
Clerk of the University and Acting Bursar

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the president of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures

must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the dis-

charge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such altera-

tions or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Anthropology
VI. Psychology
VII. Pedagogy
VIII. Economics and Sociology
IX. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the nine departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. Docents

The highest annual appointment not involving membership in the Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms and special apparatus may be purchased for their work, if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be $25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work in the department, but no examination, is required. This highest formal academic honor will

be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. Lecturers

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. Honorary Fellows

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, in-

cluding those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. Candidates for the Degree of Doctor of Philosophy

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had a substantial equivalent for the training implied by that degree.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the

candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any

person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

> That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules Concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under

whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, pro-

vided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. Degree of Master of Arts

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University

after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. Special Students not Candidates for a Degree

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed en-

tire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. Preliminary Candidates

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees, which makes the value of the appointment $300. A Junior Fel-

low may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A Citizen's Fund

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1 Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

The Eliza D. Dodge Fund

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

Purpose and Conditions of Fellowships and Scholarships

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as

indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics,

physics, chemistry, biology, psychology, pedagogy, and economics.

METHODS

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual read-

ing are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1908-1909.

I

MATHEMATICS

Programme for 1908-1909

INSTRUCTION IN MATHEMATICS

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

Differential Equations, and Calculus of Variations; 5 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables, Elliptic Functions, and Definite Integrals; 5 hours a week, through the year.

Theory of Numbers; 2 hours a week, one half-year.

Modern Synthetic Geometry; 2 hours a week, one half-year.

Algebraic Substitutions and their Application to the Theory of Equations; 2 hours a week, one half-year.

Algebraic Invariants; 2 hours a week, one half-year.

Finite Differences; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these

subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1908-1909, the following courses are offered

BY PROFESSOR STORY

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

FINITE DIFFERENCES; 2 hours a week, through the year.

Advanced courses:

HISTORY OF MATHEMATICS; 2 hours a week, first half-year.

RESTRICTED SYSTEMS OF ALGEBRAIC EQUATIONS; 2 hours a week, second half-year.

BY PROFESSOR TABER

Introductory Course:

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

Advanced Course:

PICARD-VESSIOT THEORY OF LINEAR HOMOGENEOUS DIFFERENTIAL EQUATIONS; 2 hours a week, through the year.

SEMINARY, through the year.

By PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

By M. DE PEROTT

Introductory Courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.

ABELIAN INTEGRALS; 2 hours a week, second half-year.

During the academic years 1889-1908, advanced and special courses have been given in:

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. Theory of Functions according to Cauchy, Riemann, and Weirstrass, with applications.

13. Weirstrass's Theory of Elliptic Functions.

14. Abelian Functions and Integrals.

15. Numerical Computations.

16. Theory of Quadratic Forms.

17. Analysis Situs, particularly the connectedness of surfaces and map-coloring.

18. Surfaces of the Third and Fourth Orders (analytically treated).

19. Plane Curves of the Third and Fourth Orders (analytically treated).

20. Klein's Icosahedron-Theory.

21. Elliptic Modular Functions.

22. Theta-Functions of Three and Four Variables.

23. Riemann's Theory of Hyperelliptic Integrals.

24. Symbolic Logic.

25. Twisted Curves and Developable Surfaces (torses).

26. Rational and Uniform Transformations of Curves and Surfaces.

27. Theory of Functions of a Real Variable.

28. Definite Integrals and Fourier's Series.

29. Ordinary Differential Equations, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's and Bessel's functions.

30. Partial Differential Equations, including Laplace's, Bessel's, and Lamé's functions.

31. Finite Differences and Probabilities.

32. Applications of the Infinitesimal Calculus to the Theory of Surfaces.

33. Simultaneous Equations, including Restricted Systems.

34. Theory of Transformation Groups.

35. The Application of Transformation Groups to Differential Equations.

36. Theory of Errors.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.[1] Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals are the following:

Acta mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American association for the advancement of Science. Proceedings, 1848 to date. Complete.

American journal of mathematics. Baltimore, 1878 to date. Complete.

American Mathematical Society.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

Amsterdam. Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

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[1] For requirements see p. 54.

Annali di mathematica, pura ed applicata. Milano, 1889 to date.

Annals of mathematics. 1884 to date. Complete.

Archiv der mathematik und physik. 1901 to date.

Berlin. Königlich-preussische akademie der wissenschaften. Mathematische und naturwissenschaftliche mittheilungen aus den sitzungsberichten. 1882-97. Complete.

Berliner mathematische gesellschaft. Sitzungsberichten. 1902 to date. Complete.

Bibliotheca mathematica. Stockholm, Berlin and Paris, 1884 to date. Complete.

Bologna, Istituto di. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1810.

Memorie. 1850 to date. Complete.

Boston. American academy of arts and sciences. Proceedings, 1878-95.

British association for the advancement of science. Report. 1831 to date. Complete.

Brussels. Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémoires des savants étrangers. 1889-90.

Bulletin des sciences, mathématiques et astronomiques. 1870 to date. Complete.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

Colorado, University of. Studies. 1902 to date. Complete.

Deutsche mathematiker-vereinigung. Jahresbericht. Leipzig, 1890 to date. Complete.

Edinburgh philosophical journal. 1819-1826.

Edinburgh. Royal Society. Transactions. 1783 to date. Complete.

Fortschritte der mathematik, Jahrbuch über die. Berlin, 1868 to date. Complete.

France, Société mathématique de. Bulletin. Paris, 1873 to date. Complete.

Göttingen. Königliche gesellschaft der wissenschaften. Nachrichten von der k. gesellschaft der wissenschaften und der Georg-Augusts-universität. 1853 to date.

Haarlem. Hollandsche maatschappij der wetenschappen. Archives néerlandaises des sciences exactes et naturelles. 1866 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

Internationale mathematiker-kongress. Verhandlungen. 1897 to date. Complete.

Journal de mathémetiques pures et appliquées. Paris, 1836 to date. Complete.

Journal für die reine und angewandte mathematik. Berlin, 1826 to date. Complete.

Leipzig. Königlich-sächsische gesellschaft der wissenschaften.

Berichte über die verhandlungen der mathematisch-physischen classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physischen classe. 1852 to date. Complete.

Liége. Société royale des sciences. Mémoires. 1843 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

London. Royal society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematische annalen. Leipzig, 1869 to date. Complete.

Messenger of mathematics. Oxford, Cambridge and Dublin. 1862 to date. Complete.

Milan. Reale istituto lombardo di scienze e lettere.

Classe di scienze matematiche e naturali. Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

Monatshefte für mathematik u. physik. Wien, 1908.

New York mathematical society. Bulletin. 1891-94. Complete.

Nouvelles annales de mathématiques. Paris, 1842 to date. Complete.

Paris. Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Paris. Annales scientifiques de l'école normale supèrieure. 1864 to date. Complete.

Paris. École polytechnique. Journal. 1794 to date. Complete.

Philosophical magazine. London, Edinburgh and Dublin, 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. London, 1857 to date. Complete.

Revue semestrielle des publications mathématiques, rédigée sous les auspices de la société mathématique d'Amsterdam, 1893 to date. Complete.

Rome. Reale accademia dei lincei. Atti. Rendiconti.

Tokyo. Mathematico-physical society. Proceedings (Tôkyô sûgaku-buturigakkwai kizi) 2d Ser., 1901 to date. Complete.

Vienna. Kaiserliche akademie der wissenschaften. Sitzungsberichte der mathematisch-naturwissenschaftlichen classe. 1848 to date. Complete.

Zeitschrift für mathematik und physik. Leipzig, 1856 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche unterricht. 1903 to date.

The department possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II

PHYSICS

Professor Webster will deliver the following lectures. In order to meet the convenience of students, and to prevent the necessity of waiting for the logical beginning of the cycle, the regular courses are repeated with a cycle of two years. These embrace the subjects that are indispensable, and the pursuit of them will fit the student to read and study any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands, or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a*. Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics. B. G. Teubner, Leipzig.

3b*. The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The classical theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems, and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism. London, Macmillan & Co.

4a*. Recent Developments in Electrical Theory, including the Theory of Lorentz.

The application to the theory of Electrons, and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics.

5a. Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Lamor.

5b*. Geometrical Optics. Properties of Systems of

Rays, and their various aberrations. Hamilton's Characteristic Function or Eikonal. Applications to Optical Instruments.

6. Thermodynamics. Thermo- and Electro-Chemistry.

The establishment of the two laws of Thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. The Kinetic Theory of Gases. The Maxwell-Boltzmann Theorem and the elements of Statistical Mechanics.

8*. The Theory of Radiation and of a Black Body.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent application of Thermodynamics.

9*. The phenomena of Conduction of Electricity in Gases, and of Radioactivity, and their bearing on the structure of the Atom.

10. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Helmholtz's Equation, Beltrami-Lorentz Equation, Telegrapher's Equation, and their special cases; methods of Cauchy, Green and Riemann; Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11*. The elements of Integral Equations, and their application to Mathematical Physics.

12*. Selected chapters in the application of Theoretical Physics to Cosmical Phenomena, including problems in Geodesy, the Tides, Meteorology, Seismology, and Terrestrial Magnetism.

13*. Linear Differential Equations.

The applications of the theory of functions to the linear differential equations (ordinary) which arise in mathematical physics.

14*. Orthogonal Surfaces and Curvilinear Coordinates, and their Applications.

The courses for 1908-9 will be 1, 2, 3, 4. During the past year 4a, 5a, 5b, 6, 7, 10, 11 have been given.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

The facilities without which no graduate department of research in pure and applied physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals by which the history of progress, past and present, may be studied, and kept up to date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

Among the various lines of investigation now attracting the attention of the physicists the following are preeminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and

the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics has hardly begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radioactivity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and of which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics, so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first

rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to war-

rant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Élément de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

Requirements for the Doctor's Degree

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

contained in Dr. Webster's treatise on *Dynamics* and Riemann-Weber's *Partielle Differentialgleichungen.*

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building, forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation, and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moment's notice, even at night. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department

of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is devoted to the Rowland twenty-foot diffraction grating, and has a photographic dark room attached. There has been constructed during the current year a storage-battery of two thousand small cells for researches requiring a constant source of high potential, such as a research in canal rays now in progress.

This battery is conveniently housed next to the grating room. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switchboard in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered in the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. There are few subjects connected with physics which may not be thoroughly studied in this library.

The following works may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Gibbs, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Rumford, Tait, Young, Gauss, Fourier, Leplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Korn, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Wallentin, Watson and Burbury, Webster, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Maclaurin, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchhoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston, Weinstein.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, a set of the Travaux et Mémoires du Comité International de Poids et Mesures, and of the published memoirs of the Physikalisch-technische Reichsanstalt, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.
Annales de Chimie et de Physique.
Bulletin of the Bureau of Standards.
Comptes Rendus.
Eclairage Electrique.
Journal of Physical Chemistry.
Nature.
Philosophical Magazine.
Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of the Royal Society.
Science.
Science Abstracts.
Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals also:

American Journal of Science.
Annalen der Physik.
Beiblätter zu den Annalen der Physik.
Electrical World.
Electrician.
Elektrotechnische Zeitschrift.
Fortschritte der Physik.
Jahrbuch für Elektronik.
Journal de Physique.
Le Radium.
Il Nuovo Cimento.

III

CHEMISTRY

The aim of the department is to equip students for original work in Chemistry. Such equipment, consisting in a clear knowledge of the principles and methods of the science, is believed to be best for the industrial chemist as well as for the collegiate teacher. The teacher of chemistry who is unable to contribute a share to the growth of his science will teach the dead letter of some text-book and can hardly impart to his students a practical knowledge of natural phenomena. And in the opinion of leaders of the great chemical industries in Europe, a young industrial chemist, too, is best equipped, not if he has acquired necessarily unpractical information in the chemistry of the manufactures, but if he has obtained clear critical knowledge of the principles of pure chemical science and some experience in grappling with difficulties. The desire for such knowledge, and the courage and perseverance necessary in attacking problems are acquired only through research.

The work of the department will be conducted with these principles in view and will be adjusted to the needs of the students from year to year. Advanced students will be expected to spend most of their time on research work. However, specialized courses on topics of history of chemistry, chemical dynamics, heterogeneous equilibria, stereo-chemistry, electro- and thermo-chemistry, applications of thermodynamics to chemistry, etc., will be offered, and the students will

be expected to attend them regularly. Each topic will be approached, not as a chapter in a book but as a problem in nature. It will be introduced by an estimate of its importance and of its bearing on other problems. Then an account will be given, on the historical plan as far as possible, of the extent to which the problem has been solved, of how this was done, and of how much is not yet solved, with suggestions as to practical methods by which solution might be obtained. It is believed that such form of study, much more than the "advanced" nature of the subjects studied, is the true characteristic of university work.

To aid students not quite prepared for work of this kind lecture and laboratory courses will be offered in general inorganic and organic chemistry, organic synthesis and analysis, physical chemistry, etc. The time required for such students to qualify for the degree of Doctor of Philosophy will depend in each case upon the proficiency of the student. Residence for one year is required, and three years will not be too long for most graduates. A working knowledge of analytical geometry and the calculus will be pre-supposed in all the work of the department.

The research work conducted in the department will be mainly along the following lines: 1. Experimental and theoretical study of the deviations of fact from the accepted principles of general chemistry; 2. Experimental study of organic substances and reactions from the standpoint of chemical statics and dynamics. Of course, promising investigations may be taken up, from time to time, along other lines as well.

Requirements for the Doctor's Degree

1. A good reading knowledge of both German and French, which the student ought to acquire as early as possible.

2. The presentation of a dissertation which in the opinion of the head of the department will form a valuable contribution, either theoretical or experimental, to chemical science.

3. The passing of an examination in the several branches of chemistry, including modern physical chemistry, chemical statics and chemical dynamics, and in one minor subject, to be determined in each case by the head of the Chemical Department.

Courses offered during the year 1907-08

A. *Professor Rosanoff's Courses*

1. Physical and Theoretical Chemistry. Mondays and Thursdays at 9 A. M.

2. Organic Stereo-chemistry. Tuesdays at 9 A. M.

B. *Dr. Merigold's Course*

Thermo- and Electro-chemistry. Fridays at 9 A. M.

In addition to these, Dr. J. C. Hubbard, of the Department of Physics, is giving lectures and laboratory instruction, Friday afternoons, in Electro-chemical Measurements.

During the present year the energy of the students is concentrated on their research work, and it seemed unnecessary and undesirable to offer more numerous courses.

Facilities

The University laboratories occupy a considerable part of the chemical building, and the storerooms contain an unusually large collection of organic preparations, besides all the ordinary inorganic chemicals. The collection of physico-chemical apparatus is sufficient for most purposes. Each of the more advanced students is given a private laboratory with a complete outfit for his work.

The Library contains complete files of all the more important chemical journals in English, German, and French. The collection of general works, monographs and reference books is being rapidly enlarged. All books specially needed are purchased at once.

It is believed that the facilities for serious research offered by the department are in many ways exceptional. Information regarding fellowships and scholarships is given elsewhere.

IV

BIOLOGY

Programme for Year 1908–1909

Dr. Hodge will offer the following courses:

I. Dynamic Biology and General Physiology. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. The first half-year is devoted to the study of a typical series of animals as forces in nature, special attention being directed to methods and apparatus by which dynamics of species may be investigated. On the side of biological theory, which occupies the last half of the year, among others the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. Biological Education. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures during October and November.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year,

history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1908-1909 will be the third year of the cycle.

Neurology

It is intended to arrange the course in such a manner that the general field may be covered in two years, This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows:

IV. Comparative Study of Nervous Systems and Sense Organs. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the different degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. The Human Nervous System and Sense Organs. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.[1]

[1] For elementary courses in special physiology, histology and hygiene refer to announcement of biological courses in the Collegiate Department.

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows:

VI. Practical Histology. The course will be a laboratory course, with such lectures, directions and conferences as may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

Experimental Work

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attainments. A course in biology such as is given in our

best colleges and State universities is sufficient to enable students to begin work here.

A long-felt need of the department is now supplied in the possession of land well adapted and conveniently located for biological research. Ideal facilities can now be offered for the study of daily rhythms, lives and work of species under natural conditions; and also for experiments in animal and plant breeding. It is proposed to organize an extended series of researches upon the effects of different chemical substances and conditions of life upon the viability and vigor of the germ plasm.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these is to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work

of referring to the literature of topics under investigation in the laboratory.

The Journal Club meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V

ANTHROPOLOGY

Dr. Chamberlain will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. General Anthropology, embracing: (a) History, scope and relations of the science. (b) Physical Anthropology; problems, investigations, results, laboratory work. (c) Ethnography; races and race-origins. (d) Ethnology, Including Sociology; origin and development of the arts and sciences, institutions. (e) Mythology; folk-lore, religions. (f) Linguistics; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (g) Criminal and Pathological Anthropology; physical and mental, ethnic morals. (h) Historical and Archæological; primitive man and primitive culture, the precursors of man.

B. Special Courses upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly The Characteristics of the Primitive Races and their Rôle in Human History. The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions;

the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their relations to Human Evolution; the Negro in Africa and in America; the American Indian; the Anthropology of Japan and China.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI

PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system, and sense organs; the elementary sense experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction times; feelings and emotions; memory; association; attention; apperception; will; fatigue and rest; sleep; hypnotism; temperament; character; interdependencies of mind and body. For this a special laboratory is equipped. See Dr. Sanford's announcements.

III. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Review of experimental and observational studies upon typical forms of animal life beginning with the protozoa. Instincts, animal and human infancy. Childhood and adolescence. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic people, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles lectures and clinic.

V. Anthropological Psychology; myths, custom and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

The Psychological Laboratory consists of a suite of twelve rooms on the third floor of the main building, devoted to the following purposes: 1, Departmental Library; 2, Lecture Room; 3, Large Dark Room; 5, Office of Director; 6, Apparatus and preliminary setting up of apparatus; 4, 7, 8 and 9, Rooms for demonstration and research; 10, Shop; 11, Photographic Dark Room; 12, Room for the keeping of animals and for Comparative Psychology. In space and favorable situation the Laboratory leaves little to be desired.

It is also well supplied with apparatus for both demonstration and research, and has access besides to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is

constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the General Library is full on Experimental and Physiological Psychology, and upon The Psychology of Religion and the Study of Children. The section on Criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of many of these and of the proceedings of learned societies are upon the shelves of the library.

The following courses are announced for the academic year 1908-1909.

Dr Hall's Courses

Dr. G. Stanley Hall will give the following courses:

I. The History of Modern Philosophy. This course will begin with the Patristic Period and trace the evolution of philosophy under the influence of the Church, dealing with scholasticism and then passing to the later history of philosophy in France, England and Germany to contemporary times.

II. The Development of the Mind in Animals, Primitive Man and Children. This course traces the evolution of the psychic functions in the phyletic series up the geological strata and treats comparative psychology from an evolutionary standpoint, dealing with the groups of animals somewhat in the order in which they appeared on the earth. The course is devoted largely to the amplification of the recapitulation theory, but will cover the main lines needed for child study together with its practical application and demonstration of literature upon each topic and the logic and method of various lines of work.

III. The Psychology of Christianity.

IV. Abnormal and Borderline Psychology: hysteria, epilepsy, psychasthenic states, imperative ideas, anæsthesia, functional paralysis, contractures, convulsions, stigmata, depres-

sion, exaltation, delusions, illusions, hallucinations, popular psychic epidemics, witchcraft, etc.; sex psychology and pathology, hypnotism, suggestion, automatic states, confusion, dreams, somnambulism, dual and multiple personality, troubles of vision, hearing, respiration, alimentation, circulation, aphasia of different kinds, agraphia, dementia præcox, genius, idiocy and imbecility, subnormal states, adolescence and senescence, perversions of the intellect, emotions and will.

V. The Pedagogy of different school topics from the kindergarten to the university, dealing to some extent with the history of education.

VI. Seminary, at his home, three hours every Monday evening throughout the year.

VII. Research with individuals on special subjects.

For all these courses apply for a special circular.

Dr. Sanford's Courses

The following courses or their equivalents will be given by Dr. Sanford:

1. *Physiological and Experimental Psychology.* Lectures and demonstrations following in general Wundt's *Grundzüge der physiologischen Psychologie*, portions of which will be assigned for collateral reading. Considerable attention, however, will be paid to the work of other psychologists and especially to the recent literature of the subject. Five hours a week, throughout the year.

2. *Psychological Journal Club.* Reports and discussions upon topics of interest from the current periodicals. Meetings are held at Dr. Sanford's house Saturday evenings throughout the year.

3. *Reading of German psychological texts.* Two hours a week, throughout the year.

4. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. This course is given under Dr. Sanford's direction by a qualified assistant. Four to six hours a week, throughout the year.

5. *Research.* Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr.

Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

Psychiatry

Dr. Cowles, Lecturer on Psychiatry, former head of the McLean Hospital at Waverly, Mass, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital. Dr. Cowles's course for the year 1907-1908 has included the following topics:

1-2. The dependence of psychiatry upon mental and general physiology; the concept of energy fundamental; the reflex arc and integrative action of the nervous system. Relation of inhibition to anabolism, to external function and katabolism.

3. The physiology and pathology of emotion; depression and exaltation figurative expressions in psychology, both being excitations and katabolic; relations of feeling-tone to conditions of ill-being.

4. Psychasthenia and neurasthenia; the minor psychoneuroses,—psychological automatism, fixed ideas, hysteria.

5. Mental symptoms of nervous exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

6, 7, 8. The melancholia-mania group of neuropsychoses (not tending to dementia).

Dr. Cowles's lectures are open without fee:

(1) To all members of the Faculty of the University and College;

(1) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is $5.00.

VII

PEDAGOGY

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

I. (a) Child Study. (b) Pedagogical Psychology. (c) Experimental Pedagogy. (d) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organization of Schools in Different Countries. (b) The Teaching Profession. (c) Motor Education, including manual training, physical education, etc. (d) Moral and Religious Education. (e) Ideals.

The courses in pedagogy for 1908-1909 will be as follows:

Dr. Burnham's Courses

A. The Hygiene of Instruction. Mental hygiene and the hygiene of instruction. The laws of nervous activity in relation to problems of instruction. Fatigue. The period of study. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygienic aspects of grading, of examinations, of discipline, of punishment, etc. One hour a week, throughout the year.

B. The Teaching Profession. The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The medieval teacher. The teacher of the early Renaissance. The Reformation. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, *et al.* The teaching profession in Germany. The function of the teacher in social evolution. The functions of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental Principles concerning the training of teachers. Different plans tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. Once a week, half a year.

C. Recent Movements and Present Problems in Education and School Hygiene. This course will involve the discussion of special topics and problems of pedagogy, school hygiene, child study, and educational psychology. Topics like the following will be considered from the point of view of genetic psychology and of hygiene:—Correlation. Enrichment of the course of study. Grading. Doctrines of interest. Training of the will. Problems of organization and administration. Recent educational literature. One hour a week, half a year.

D. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to Experimental Pedagogy. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. One or two hours a week, throughout the year.

PRESIDENT G. STANLEY HALL'S COURSE

THE PEDAGOGY OF DIFFERENT SCHOOL TOPICS from the kindergarten to the university, dealing to some extent with the history of education.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a

large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of $20.

VIII

ECONOMICS AND SOCIOLOGY

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, and each year such courses will

be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including labor legislation.
5. Theory of Sociology. (See announcement of Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1908-1909 the following courses are offered.

By Professor Wright

3. Theory and Use of Statistics.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. Labor Problems.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. Seminary.

By Dr. Bushee

5. Theory of Sociology. (See announcement of Collegiate Department.)

And one or more of the following courses:

1. Economic Theory during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. Literature of Sociology. In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumplowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. Socialism and Communism. This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. Seminary in Economics and Sociology. Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX

HISTORY

Dr. Blakeslee will offer the following courses:

1. Contemporary History.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information from the lectures and from extended reading; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

The subjects recently studied have been: Russia,—political; social, and constitutional development, with emphasis upon the causes and the events of the present revolutionary movement; the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment; the history of the American Negro and the present Negro problem; the Government of Dependencies, including such topics as Race Psychology and the problems of the social, economic, and religious education of primitive peoples; and the present situation in the Far East, especially Manchuria, Korea, Japan, China, the Philippines and Hawaii.

Each year one of the following courses also will probably be given:

2. International Law.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite

cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. English History—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. The History of the Christian Church.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. Economic History of Europe.

The aim of the course will be to give a general account of the rise and development of the leading economic and social institu-

tions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students of economics.

6. United States History. Different subjects for this course may be taken in succeeding years such as: Colonial Possessions of the United States, including a sketch of the history of the Dutch, Spanish and Portuguese colonies, and a comparison of their problems, successes and failures with those of the United States in the Philippines and Porto Rico; the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. The students will be expected to present reports upon topics assigned by the instructor; these will form the basis for a critical discussion.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

Library Committee

President G. Stanley Hall, *Chairman*
President Carroll D. Wright
Professor William E. Story, *Secretary*

Library Staff

Louis N. Wilson, *Librarian*

ASSISTANTS

Edith M. Baker, *Senior Assistant*

Edith M. Burrage
Helen J. Elliot
Leroy M. Handy
Mary D. Thurston
Helen E. Tunbridge

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 45,000 bound volumes and 1,500 pamphlets, and the reading-room receives over 400 journals.

The books are grouped as follows:

A Works of General Reference
B Journals
C Mathematics
C D Math.-Physics
D Physics
D E Physical Chemistry
E Chemistry
F Biology, Zoology, Botany, Physiology, Neurology
G Geography
H Pathology
I Psychology
J Philosophy
K Religious Psychology
L Biography
M Anthropology
N Education
O General Science
P History
Q Law
R Political and Social Science
S English
T Modern Languages
U Classics
W Practical Arts
X Library Science
Y Art
Z Manuscripts

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 286 volumes were borrowed from, and 117 volumes

lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

VOL. 1

No. 1. WILSON, LOUIS N.
Bibliography of the Published Writings of President G. Stanley Hall. Oct. 1903.

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1902. Jan. 1904.

No. 3. Proceedings and Addresses at the Public Opening of the Library Building of Clark University, Thursday, January 14. 1904. Apr. 1904.

No. 4. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1903. July 1904.

No. 5. WILSON, LOUIS N.
Preparing Manuscript for the Press. Jan. 1905.

No. 6. Founder's Day, Clark University. Apr. 1905.

No. 7. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1904. July 1905.

No. 8. DE PEROTT, JOSEPH
The Probable Source of the Plot of Shakespeare's Tempest. Oct. 1905.

No. 9. Proceedings and Addresses at the Public Opening of the Art Department of Clark University. Dec. 1905.

VOL. 2

No. 1. List of Books and Pictures in the Clark Memorial Collection. pp. 74+6. July 1906.

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1905. pp. 24. Oct. 1906.

No. 3. WILSON, LOUIS N.
A few titles in Child Study. pp. 8. Apr. 1907.

No. 4. Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D.C., Alumni Association, 1907. pp. 39. June 1907.

No. 5. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1906. pp. 26. Aug. 1907.

The department of religious psychology, established within the past few years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which two volumes have been completed and a third volume begun.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and 165,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 10,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

> "the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF

THE LIBRARY, Vol. 2, No. 1. A Curator and Custodian of them have been appointed by the Board (see page 95) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work, for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or Fellow shall enter upon other engagements outside

his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at

the October meeting, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 20, 1907, the University conferred degrees upon the following persons:

MASTER OF ARTS

Charles Walter Bacon
Dissertation: A study of the determination of carbon by combustion.

Francis Marsh Baldwin
Dissertation: Daily life of the earthworm.

Johannes Broene
Dissertation: The early philosophy of Friedrich Nietzsche.

Charles Elbert Disney
Dissertation: Microscopic structure of insect galls.

Edith Montgomery Dixon
Dissertation: Problem of the cat in relation to bird life.

Louise Ellison
Dissertation: The psychology of definition as illustrated in children's definitions of abstract terms. Abstract in American Journal of Psychology, April, 1908.

Carleton Bell Nickerson
Dissertation: A study of the solubility and reduction products of potassium chlorplatinate.

Caroline Amelia Osborne
Dissertation: The cat: A neglected factor in sanitary science. Pedagogical Seminary, December, 1907, Vol. 14, pp. 439-459.

Timothy Joseph Stevenson
Dissertation: The time relations of binocular phenomena. American Journal of Psychology, January, 1908, Vol. 19, pp. 130-137.

Jun Watanabe
Dissertation: The relation of trusts to labor unions.

DOCTOR OF PHILOSOPHY

Lewis Flint Anderson

Dissertation: The development of the non-professional school in Europe before the Renaissance. Pedagogical Seminary, March and June, 1907, Vol. 14, pp. 1-38, 223-282.

Horace Leslie Brittain

Dissertation: A study in imagination. Pedagogical Seminary, June, 1907, Vol. 14, pp. 137-207.

William Franklin Copeland

Dissertation: Periodicity in spirogyra.

Oris Polk Dellinger

Dissertation: Comparative study of cilia as a key to the structure of contractile protoplasm.

David Spence Hill

Dissertation: The education and problems of the Protestant ministry in the United States.

Tadasu Misawa

Dissertation: A sketch of the history of the modern philosophy of education.

George Edwin Stebbins

Dissertation: Sound distortion by the telephone transmitter and receiver.

William Edward Story, Jr.

Dissertation: An investigation on the Poulsen arc in wireless telegraphy.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements.

Eugene W. Bohannon
A. Caswell Ellis

PUBLICATIONS RELATING TO THE UNIVERSITY

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

The American Journal of Psychology. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July

and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price, $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The Pedagogical Seminary. This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers —issued in March, June, September and December. Price, $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The American Journal of Religious Psychology and Education. This journal was begun in May, 1904, and three numbers constitute a volume. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and publishes original articles. Each number contains about 100 pages. Price, $3.50 per volume, $1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron on a white field.

Clark University
in the City of Worcester
Massachusetts

Register and Twenty-first Official Announcement

1909

BOARD OF TRUSTEES

Thomas H. Gage	Arthur F. Estabrook
A. George Bullock	Herbert Parker
Orlando W. Norcross	Lucius Tuttle
Francis H. Dewey	Austin S. Garver

OFFICERS

President . .	A. George Bullock
Vice-President .	Francis H. Dewey
Treasurer . .	Thomas H. Gage
Secretary . .	G. Stanley Hall

COMMITTEES

Finance

Thomas H. Gage	Francis H. Dewey
A. George Bullock	Arthur F. Estabrook

Buildings

Thomas H. Gage	Orlando W. Norcross

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER

AND

Twenty-first Official Announcement

WORCESTER, MASSACHUSETTS
PUBLISHED FOR THE UNIVERSITY
March, 1909

CALENDAR 1909-1910

1909			
April	5	Monday	Spring Recess
April	10	Saturday	
April	19	Monday	Patriots' Day
May	31	Monday	Memorial Day
June	17	Thursday	Twentieth academic year closes
		Summer Vacation of 14 Weeks	
Sept.	23	Thursday	Twenty-first academic year begins
Nov.	25	Thursday	Thanksgiving Day
Dec.	25	Saturday	Christmas Recess
1910			
Jan.	1	Saturday	
Feb.	1	Tuesday	Founder's Day*
Feb.	22	Tuesday	Washington's Birthday
April	4	Monday	Spring Recess
April	9	Saturday	
April	19	Tuesday	Patriots' Day
May	30	Monday	Memorial Day
June	16	Thursday	Twenty-first academic year closes

*Not a holiday

Carroll Davidson Wright

Professor of Statistics and
Social Economics
1904-1909

Born at Dunbarton, N. H., July 25, 1840
Died at Worcester, Mass., February 20, 1909

MEMBERS

STAFF

G. STANLEY HALL, PH. D., LL. D. 94 Woodland St.
President of the University and Professor of Psychology

A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D. 17 Hammond St.
Professor of Mathematics and Secretary of the Faculty

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark College, 1902-07. Member of the National Academy of Sciences; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D. 24 Richards St.
Professor of Experimental and Comparative Psychology

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903-07; Director of Psychological Laboratories.

ARTHUR G. WEBSTER, PH. D., Sc. D., LL. D.
Professor of Physics 66 West St.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; Professor of Physics, Clark College, 1902-07; Director of Physical Laboratories; D. Sc., Tufts College, 1905; LL. D., Hobart College, 1908. Member of the National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH. D.
Professor of Mathematics 65 West St.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT,* PH. D., LL. D. 96 Woodland St.
Professor of Statistics and Social Economics
President, Clark College, 1902– .

CLIFTON F. HODGE, PH. D. 103 May St.
Professor of Biology

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902– .

WILLIAM H. BURNHAM, PH. D. 17 Circuit Ave.
Professor of Pedagogy and School Hygiene

A. B., Harvard University, 1882; Instructor in Wittemberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86, Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900–1906.

ALEXANDER F. CHAMBERLAIN, PH. D. 19 Baker St.
Assistant Professor of Anthropology

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Bibliographical Editor, *Journal of American Folk-Lore*. Corresponding Member O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society; Honorary Member American Folk-Lore Society; Fellow American Theological Society.

MARTIN A. ROSANOFF, Sc. D. 2 Grand St.
Assistant Professor of Chemistry

Ph. B., New York University, 1895; Sc. D., 1908; Student, University of Berlin, 1895-96; University of Paris, 1896-98; Research Fellow, New York University, 1899-1900; Instructor in Theoretical Chemistry, New York University, 1904-05; Assistant Professor of Chemistry, 1905-07; Assistant Professor of Organic Chemistry, Clark College, 1907– ; Director of Chemical Laboratories.

JOSEPH DE PEROTT 5 Hawthorn St.
Lecturer in Mathematics
Student, Universities of Paris and Berlin, 1877-80.

LOUIS N. WILSON, LITT. D. 11 Shirley St.
Librarian of the University and Custodian of the Art Collection
A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

BENJAMIN S. MERIGOLD, PH. D. 25 Chatham St.
Instructor in Chemistry

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard University, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Clark College, 1903– .

* Deceased February 20, 1909.

GEORGE H. BLAKESLEE, PH. D. 940 Main St.
Instructor in History

A. B., Wesleyan University, 1893; A. M., Harvard University, 1899; Ph. D. 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Clark College, 1903-04; Assistant Professor, 1904– .

FRANK H. HANKINS, PH. D. 45 Hollywood St.
Instructor in Economics and Sociology

A. B., Baker University, 1901; Student, Columbia University, 1903-1904; Scholar in Sociology, 1904-1905; Fellow in Statistics, 1905-1906; Student, 1907-08; Ph. D., Columbia University, 1908; Instructor in Economics, Clark College, 1906-07; Assistant Professor, 1908– .

ANNUAL APPOINTMENTS

EDWARD COWLES, M. D., LL. D., Boston
Non-Resident Lecturer on Psychiatry

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886- ; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888- ; LL. D., Dartmouth College, 1890.

HONORARY FELLOWS

CHARLES W. BACON, A. M., North Oxford
Honorary Fellow in Chemistry and Research Assistant to Professor Rosanoff

A. B., Clark College, 1906; Scholar in Chemistry, Clark University, 1906-08; A. M., Clark University, 1907; Assistant in Chemistry, Clark College, 1907– .

GUY GAILLAIRD BECKNELL, M. S., Goshen, Indiana
Research Assistant to Professor Webster 18 Gates St.

B. S., Northwestern University, 1904; M. S., 1905; Fellow in Physics, Northwestern University, 1905; Assistant Instructor in Physics, Purdue University, 1905-06; Instructor, 1906-08.

JOHANNES BROENE,* A. M., Grand Rapids, Michigan
Honorary Fellow in Psychology

Pd. B., Valparaiso University, 1906; Scholar in Psychology, Clark University, 1906-07; Fellow, 1907-08; A. M., Clark University, 1907.

ELNORA WHITMAN CURTIS, A. M.
Honorary Fellow in Psychology Burncoat St.

A. B., Smith College, 1892; Scholar in Psychology, Clark University, 1907-08; A. M., Clark University, 1908.

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*On leave of absence

JOHN CHARLES HUBBARD, PH. D.
Honorary Fellow in Physics 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02; Fellow, 1902-04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904-05; Assistant Professor of Physics, New York University, 1905-06; Assistant Professor of Physics, Clark College, 1906– ; Honorary Fellow in Physics Clark University, 1907-08.

HIKOZO KAKISE, Oitaken, Japan
Research Assistant to Professor Sanford 76 Woodland St.

Graduate, Tokio Imperial University, 1901; Assistant in Psychology, *ibid.*, 1902-06; Fellow in Psychology, Clark University, 1906-07; Research Assistant in Psychology, 1907-08.

JAMES HUFF McCURDY, M. D., Springfield
Honorary Fellow in Biology 28 Hollywood St.

Graduate International Y. M. C. A. Training School in 1890; M. D., New York University Medical School, 1893; Special Student in Experimental Physiology, Harvard Medical School, 1900; M. P. E., International Y. M. C. A. Training School, 1907.

CAREY EYSTER MELVILLE, A. B.
Honorary Fellow in Mathematics 101 May St.

A. B., Northwestern University, 1901; Fellow in Mathematics, *ibid.*, 1901-02; Graduate Student in Mathematics, Johns Hopkins University, 1902-03; Instructor in Mathematics, Case School of Applied Science, 1903-06; Honorary Fellow in Mathematics, Clark University, 1906-08; Assistant in Mathematics, Clark College, 1906– .

NEWTON MILLER, PH. D., Thorntown, Indiana
Honorary Fellow in Biology 78 Florence St.

A. B., Indiana University, 1905; A. M., 1906; Fellow in Biology, Clark University, 1906-08; Ph. D., Clark University, 1908; Instructor in Biology, Clark College, 1908– .

TADASU MISAWA, PH. D., Takanabe, Japan
Honorary Fellow in Psychology 103 May St.

Graduate, Tokio Imperial University, 1904; Fellow in Psychology, Clark University, 1905-07; Honorary Fellow, 1907-08; Ph. D., Clark University, 1907.

CAROLINE A. OSBORNE, PH. D.
Honorary Fellow in Psychology 87 Woodland St.

M. D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904-; Student in Biology, Clark University, 1901-05; Fellow, 1905-06; Honorary Fellow, 1906-08; A. M., Clark University, 1907, and Ph. D., 1908.

JAMES P. PORTER, PH. D.
Honorary Fellow in Psychology 60 Lovell St.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of Work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-08; Ph. D., Clark University, 1906; Instructor in Psychology, Clark College, 1903-07; Assistant Professor, 1907– .

THOMAS LANSING PORTER, A. M., Evanston, Illinois
Honorary Fellow in Physics 18 Gates St.

B. S., Northwestern University, 1907; Laboratory Assistant in Physics, *ibid.*, 1906-07; Research Assistant to Professor Webster, Clark University, 1907-08; A. M., Clark University, 1908; Instructor in Physics, Clark College, 1908– .

RURIC NEVEL ROARK,* PH. D., Richmond, Kentucky
Honorary Fellow in Psychology

A. B., Normal University, Lebanon, Ohio, 1880; Professor of Natural Science, *ibid.*, 1880-85; Principal of Normal School, Glasgow, Ky., 1885-89; Ph. D., Normal University, 1896; Dean, Dept. of Pedagogy, Kentucky State College, 1889-1905; Honorary Fellow in Psychology, Clark University, 1905-06; President, State Normal School, Richmond, Ky., 1906– .

W. F. ROBIE, M. D., Baldwinville
Honorary Fellow in Psychology and Biology

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902-07; Pine Terrace Sanitarium, 1907- ; Student in Psychology and Biology, Clark University, 1904-05; Honorary Fellow, 1905-08.

EUGENE C. ROWE,* A. B., Mt. Pleasant, Michigan
Honorary Fellow in Psychology

A. B., Olivet College, 1897; Head of Department of Psychology and Education, State Normal School, Mt. Pleasant, Mich., 1901- ; Fellow in Psychology, Clark University, 1907-08.

THEODATE L. SMITH, PH. D.
Research Assistant to President Hall 23 Maywood St.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, October 1904-February 1905: Berlin University, April-August, 1905; Research Assistant to President Hall, Clark University, 1905– .

AMY ELIZA TANNER, PH. D., Faribault, Minnesota
Honorary Fellow in Psychology 80 Woodland St.

A. B., University of Michigan, 1893; Scholar, University of Chicago, 1894-95; Fellow, 1895-98; Ph. D., University of Chicago, 1898; Associate in Philosophy, *ibid.*, 1898-1902; Professor of Philosophy, Wilson College, 1903-07; Honorary Fellow in Psychology, Clark University, 1907-08.

FELLOWS AND SCHOLARS

RUDOLPH ACHER, A. B.
Fellow in Psychology 101 May St.

A. B., Indiana University, 1908.

NORMAN HERBERT ANNING, M. A., Oxmead, Canada
Fellow in Mathematics 8 Loudon St.

B. A., Queen's University, Kingston, Canada, 1905; M. A., 1906; Tutor in Physics, *ibid.*, 1903-04; Tutor in Mathematics, 1904-05; Fellow in Mathematics, Clark University, 1906-08.

* On leave of absence.

L. ESTELLE APPLETON, S. M., Victory, Vermont
Fellow in Psychology 13 Charlotte St.

L. B., Oberlin College, 1886; Ph. B., 1890; Ph. M., University of Chicago, 1903; S. M., 1904; Instructor and Supervisor in State Normal Training Schools, 1898-1901; Principal and Supervisor, City Normal Training Schools, 1901-03; Director School of Education, Upper Iowa University, 1907-08.

JOHN FRANKLIN BOBBITT, A. B.
Fellow in Pedagogy 15 Piedmont St.

A. B., Indiana University, 1901; Principal of Normal School, Mindanao, 1902-03; Instructor in Educational Methods, Manila Normal School, 1903-07; Fellow in Pedagogy, Clark University, 1907-08.

HARRY WOODBURN CHASE, A. M., Groveland
Fellow in Psychology 78 Florence St.

A. B., Dartmouth College, 1904; A. M., 1908.

LUCETTA CRUM, Ph. B., Logansport, Indiana
Fellow in Psychology 28 Downing St.

Ph. B., Coe College, 1905.

LOUISE ELLISON, A. M., St. Louis, Missouri
Fellow in Psychology 2 Woodbine St.

A. B., Washington University, 1906; Scholar in Psychology, Clark University, 1906-07; Fellow, 1907-08; A. M., Clark University, 1907.

AUSTIN PERRY FINLEY, B. D.
Fellow in Psychology 18 Crystal St.

A. B., Kentucky University, 1899; A. M., 1906; B. D., Harvard Divinity School, 1908.

BURTON NOBLE GATES, A. M.
Fellow in Biology 10 Charlotte St.

A. B., Clark College, 1905; Scholar in Clark University, 1905-06; Fellow, 1906-07; A. M., Clark University, 1906; Colaborator, Bureau of Entomology, U. S. Department of Agriculture, February 1907–July 1907; Expert in Apiculture, *ibid.*, July 1907–October 10, 1908.

ELMER A. HARRINGTON, A. M., Winchendon
Fellow in Physics 17 Oread Place

A. B., Clark College, 1905; Scholar in Physics, Clark University, 1905-06; Fellow, 1906-07; A. M., Clark University, 1906; Student in Physics, University of Berlin, 1907-08.

EUCLID HELIE, A. M., Grand Ligne, Quebec
Fellow in Psychology 103 May St.

A. B., McMaster University, Toronto, Canada, 1905; Scholar in Psychology, Clark University, 1905-06; Fellow, 1906-08; A. M., Clark University, 1908.

GEORGE ALEXANDER HUTCHINSON, A. M., Bedford, Indiana
Fellow in Psychology 101 May St.

A. B., Indiana University, 1906; A. M., 1908; Assistant in Psychological Laboratory, *ibid.*, 1907-08.

KYUGORO ISHIZAWA, A. M., Hobara, Japan
Fellow in Economics — 46 Woodland St.

Graduate Waseda University, 1898; LL. B., Chyuo University, 1900; A. M., State University of Iowa, 1904; A. M., University of Wisconsin, 1907; Fellow in Economics, Clark University, 1907-08.

SAKYO KANDA, Tokyo, Japan
Fellow in Psychology — 54 Florence St.

Graduate, Kansei Gakuin, 1900; Scholar in Psychology, Clark University, 1907-08.

M. ALBERTUS KAYLOR, Pd. B., Huntington, Indiana
Fellow in Psychology — 41 Maywood St.

Pd. B., Valparaiso University, 1907.

JUNICHIRO KINOSHITA, A. M., Tokio, Japan
Fellow in Economics — 27 Hollywood St.

Graduate, Doshisha College, 1892; Meiji University (Law), 1899; A. M. Yale University, 1907; Fellow in Economics, Clark University, 1907-08.

WILLIAM A. MATHENY, Ph. B., Athens, Ohio
Fellow in Biology — 1 Kilby St.

Ph. B., Ohio University, 1908; Assistant in Botany, Clark College, 1908- .

MAURICE WALTER MEYERHARDT
Fellow in Psychology — 5 Clayton St.

Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar 1904-07; Fellow 1907-08.

RAYMOND KURTZ MORLEY, A. M.
Fellow in Mathematics — 24 Downing St.

A. B. and A. M., Tufts College, 1904; Instructor in Mathematics, University of Maine, 1904-07; Scholar in Mathematics, Clark University, 1907-08.

MARGARET MORSE, A. B., Amherst
Fellow in Biology — 23 Maywood St.

A. B., Mount Holyoke College, 1906; Scholar in Biology, Clark University, 1907-08.

EBEN MUMFORD, Ph. D., Lansing, Michigan
Fellow in Psychology — 16 Florence St.

A. B., Buchtel College, 1896; Fellow in Sociology, University of Chicago, 1900-01; Student at University of Berlin, 1901-02; Student at University of Paris, 1902; Fellow in Sociology, University of Chicago, 1902-04; Ph. D., University of Chicago, 1906.

JOHN A. MUNSON, A. M.
Fellow in Psychology — 17 Kilby St.

A. B., Central University of Iowa, 1891; A. M., University of Michigan, 1894; Instructor in Modern Languages, Central University of Iowa, 1890-93; Vincennes University, 1895-96; Syracuse University, 1903; Massachusetts Agricultural College, February–June, 1908; Scholar in Psychology, Clark University, October, 1907–February, 1908.

YASUMA NAKAMURA, Nagasaki, Japan
Fellow in Psychology — 60 Lovell St.

Graduate, Chuizei College, 1903.

HOWARD W. ODUM, A. M., Covington, Georgia
Fellow in Psychology 23 Maywood St.

A. B., Emory College, 1904; A. M., University of Mississippi, 1906; Assistant in Latin, University of Mississippi, 1905-08.

LEROY WALTER SACKETT, A. B., Bloomington, Indiana
Fellow in Psychology 1 Wilcox St.

A. B., Central Normal College, 1906; Indiana University, 1908.

SIMEON SPIDLE, B. D., Holden
Fellow in Psychology

A. B., Acadia University, 1897; B. D., Newton Theological Institution, 1903.

GEORGE HENRY STEVES, A M., Onsted, Michigan
Fellow in Psychology 24 Beaver St.

A. B., University of Michigan, 1905; Scholar in Psychology, Clark University, 1907-08; A. M., Clark University, 1908.

JOHN HOWARD STOUTEMYER, A. B., Onarga, Illinois
Fellow in Psychology 24 Downing St.

A. B., Kalamazoo College, 1905; A. B., University of Chicago, 1906; Graduate Student, University of Chicago, 1905-07.

EDWARD E. WEAVER, A. M., Catonsville, Maryland
Fellow in Psychology 6 Hancock St.

A. B., University of Wooster, 1885; A. M., Princeton University, 1889; Graduate, Princeton Theological Seminary, 1889; Fellow in Psychology Clark University, 1907-08.

CLARENCE D. WRIGHT, A. B., Graniteville
Fellow in Chemistry 41 Hollywood St.

A. B., Clark College, 1908.

THOMAS J. BOWEN, A. B.
Scholar in Psychology 984 Main St.

A. B., College of the Holy Cross, 1908.

JESSE BRUNER, A. B., Claypool, Indiana
Scholar in Biology 78 Florence St.

A. B., Indiana University, 1907; Assistant in Embryology, Indiana University, 1907.

CHESTER A. BUTMAN, Rockport
Scholar in Physics 8 Loudon St.

Assistant in Physics, Tufts College, 1907-08.

CHARLES S. CARROLL, A. B.
Scholar in Psychology 35 Columbia St.

A. B., College of the Holy Cross, 1908.

EDMUND S. CONKLIN, B. H., New Britain, Connecticut
Scholar in Psychology 78 Florence St.

Bachelor of Humanics, Y. M. C. A. Training School, Springfield, Mass. 1908.

JOHN EDWARD DOWD, A. B.
Scholar in Psychology — 23 Winter St.
A. B., College of the Holy Cross, 1905.

HELEN M. DOWNEY, A. B.
Scholar in Pedagogy — 52 Piedmont St.
A. B., Wellesley College, 1908.

CHARLES L. KELLEY, A. B.
Scholar in Chemistry — 123 Grafton St.
A. B., Clark College, February, 1909.

ANNA LOUISE KRANZ, A. B., Hendersonville, Tennessee
Scholar in Psychology — 15 Charlotte St.
Licentiate of Instruction, Peabody College for Teachers, University of Nashville, 1906; A. B., 1908.

WILLIAM J. MONTGOMERY, A. M.
Scholar in Mathematics — 7 Barbour St.
A. B., Clark College, 1907; Scholar in Mathematics, Clark University, 1907-08; A. M., Clark University, 1908.

GEORGE FRANCIS MORIARTY, A. B.
Scholar in Pedagogy — 7 Ingalls St.
A. B., Clark College, 1908; Instructor, University of Vermont, November 1908– .

LEUELLA MUMFORD, Lansing, Michigan
Scholar in Psychology — 16 Florence St.
Student, College for Women, Western Reserve University, 1899; University of Chicago, three and a half years.

LEONARD BLAINE NICE, PH. B., Athens, Ohio
Scholar in Biology — 103 May St.
Ph. B., Ohio University, 1908; Assistant in Physiology, Hygiene and Bacteriology, Clark College, 1908– .

THOMAS FRANCIS POWER, A. B.
Scholar in Chemistry — 10 Tufts St.
A. B., Clark College, 1908.

CARLTON E. RICHARDSON, A. B.
Scholar in History — 87 May St.
A. B., Clark College, 1908.

JOHN J. SALMON, A. B.
Scholar in Psychology — 25 Gates St.
A. B., College of the Holy Cross, 1895.

J. BRAINERD THRALL, A. B., Leicester
Scholar in Psychology
A. B., Amherst College, 1873; Student, University of Leipzig, 1875-76; Student, Yale Divinity School, 1876-78.

AUGUSTA WIGGAM, A. B., Emporia, Kansas
Scholar in Psychology 37 May St.
A. B., College of Emporia, 1908.

SPECIAL STUDENTS

MAX BAFF, M. D.
Student in Psychology 62 Providence St.
M. D., College of Physicians and Surgeons, Columbia University, 1902; Fellow Massachusetts Medical Society; Member American Medical Association.

JOHN MERRICK BEMIS, M. D.
Student in Psychiatry Herbert Hall Hospital
M. D., University of Vermont, 1893; Special Student in Biology, Clark University, 1899-1900; Special Student in Psychiatry, 1904-08.

ELLEN HART BENTLEY, A. B.
Student in History and Economics 7 Downing St.
A. B., University of Nebraska, 1896.

JAMES ATKINS BULLARD, A. B., East Orange, N. J.
Student in Mathematics 21 Dayton St.
A. B., Williams College, 1908; Instructor in Mathematics, Worcester Polytechnic Institute, 1908- .

ARTHUR DEXTER BUTTERFIELD, A. M.
Student in Physics and Mathematics 10 Schussler Road
B. S., Worcester Polytechnic Institute, 1893; M. S., 1898; A. M., Columbia University, 1904; Instructor in Civil Engineering, Worcester Polytechnic Institute, 1894-98; Instructor in Mathematics, Engineering Department, University of Vermont, 1898-1900; Assistant Professor of Mathematics, Engineering Department, University of Vermont, 1900-04; Professor of Mathematics and Mechanics, Engineering Department, University of Vermont, 1904-08; Assistant Professor of Mathematics, Worcester Polytechnic Institute, 1908- .

GERTRUDE E. CORNISH, B. S.
Student in Psychology and Pedagogy 14 Green Lane
B. S., Middlebury College, 1901.

THOMAS J. CROSS, A. M.
Student in Psychology 24 Russell St.
A. B., New Windsor College, 1889; A. M., 1892.

VARNUM PIERCE CURTIS, A. M.
Student in Economics 96 Stafford St.
B. S., Worcester Polytechnic Institute, 1901; C. E., 1905; A. M., Columbia University, 1906.

THOMAS FREDERICK DAVIES, Jr., A. M.
Student in Psychology 13 Ashland St.
A. B., Yale University, 1894; B. D., General Theological Seminary, 1897; A. M., Yale University, 1907.

KATHERINE FRANCES DOLAN
Student in Psychiatry — Herbert Hall Hospital

ROBERT JOHN FLOODY, S. T. B.
Student in Psychology — 43 Endicott St.

Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-06; Honorary Scholar, 1906-07; Special Student, 1907-08.

ROBERT HUTCHINGS GODDARD, B. S.
Student in Physics — 1 Maple Hill

B. S., Worcester Polytechnic Institute, 1908; Instructor in Physics, *ibid.*, 1908–.

CHARLES BRIGHAM HARRINGTON, M. S.
Student in Physics — Mower St.

B. S., Worcester Polytechnic Institute, 1904; M. S., 1906; Instructor in Physics, *ibid.*, 1906-08.

McLEOD HARVEY, A. B.
Student in Psychology — 5 Oread Place

A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-06; 1907-08.

ETHEL CHRISTINE HOWE, A. B.
Student in Psychology — 23 Olive Ave.

A. B., Wellesley College, 1908.

FREDERIC ALLEN MOONEY, A. M.
Student in Psychology — 30 Oberlin St.

B. D., St. Lawrence University, 1905; A. B. and A. M., Tufts College, 1908.

CLARENCE V. MURPHY, Rutland
Student in Organic Chemistry

In charge of bacteriological and medico-chemical laboratory, Massachusetts State Sanitarium.

NELLIE MANN OPDALE, Marlboro
Student in Psychology

Special Student in Psychology, Clark University, 1907-08.

AKIYOSHI SASABE, Tokyo, Japan
Special Student in Psychology — 17 Richards St.

Graduate, Tokyo Imperial University, 1897; Professor, Tokyo Girls' Higher Normal School, 1900-1909.

EDWARD B. SAUNDERS, A. B., Fitchburg
Student in Psychology

B. D., St. Lawrence University, 1900; A. B., 1904; Special Student in Psychology, Clark University, 1906-08.

HENRY D. STEVENS, B. S., Sterling
Student in Psychology
B. S., Cornell University, 1873.

ESTHER A. STONE, A. B., Ayer
Student in Library Methods
A. B., Smith College, 1908.

NORA JENNINGS SWEENEY
Student in Psychiatry Herbert Hall Hospital
Special Student in Psychiatry, Clark University, 1907-08.

VINCENT E. TOMLINSON, S. T. D.
Student in Psychology 32 Irving St.
B. S., Buchtel College, 1880; B. D., Tufts College, 1884, and S. T. D., 1904.

INMAN L. WILLCOX, A. M.
Student in Philosophy 138 Elm St.
A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-08.

UNDERGRADUATES ATTENDING ONE OR MORE UNIVERSITY COURSES

DAVID J. ARNOLD
WILLIAM V. R. BALDWIN
GARDNER C. BASSET
ARNOLD A. BENT
CLARENCE N. BOYNTON
HOWARD E. CHASE
CHARLES P. CHRISTOPHER
FREDERICK E. CHURCH
GEORGE E. T. COLE
CHARLES S. CURTIS
WALTER S. FOLEY
SAMUEL W. HIRSCH
HAROLD A. HUGHES
JOHN L. HUGHES
REUBEN KAUFMAN
EDMUND R. LAINE, JR.
ROBERT H. LOOMIS
CLINTON N. MACKINNON
DANIEL J. MARSHALL
THOMAS L. PATTERSON
THOMAS W. A. SHEEHAN
EDMUND D. STYLES
HUBERT C. THOMPSON
KHALIL A. TOTAH
FRANK A. WALKER

ATTENDANTS UPON SATURDAY COURSES

J. MACE ANDRESS	Worcester
MARGARET V. BROWN	Worcester
ANNA G. FOLEY	Worcester
LEE T. GRAY	Palmer
LYDIA R. HILLER	Westboro
GEORGE F. HOPKINS	Fitchburg
HENRIETTA A. MURRAY	Worcester
LUCY H. OLMSTED	Worcester
BERTHA M. ROGERS	Hopedale
KATE E. SMITH	Worcester
MARY BARTLETT SMITH	Wellesley Hills
FRANCES TABER	Worcester

FLORENCE CHANDLER — 938 Main St.
Bursar, and Clerk of the University

Instructors	16
Fellows, Scholars and Students	91
Undergraduates	25
Saturday courses	12
Total	144

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the president of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters that concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures

must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the dis-

charge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such altera-

tions or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any time for incapacity, neglect of duty or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Anthropology
VI. Psychology
VII. Pedagogy
VIII. Economics and Sociology
IX. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the nine departments shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. Docents

The highest annual appointment not involving membership in the Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms and special apparatus may be purchased for their work, if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be $25, which the Faculty shall have power to remit in case of need.

A memoir or essay representing original work in the department, but no examination, is required. This highest formal academic honor will

be strictly reserved for those of marked scientific attainment and teaching ability, and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. Lecturers

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. Honorary Fellows

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, in-

cluding those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. Candidates for the Degree of Doctor of Philosophy

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had a substantial equivalent for the training implied by that degree.

At least one year, but in most cases three years, of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the

candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any

person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules Concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under

whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (Name of Chief Instructor)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, pro-

vided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. Degree of Master of Arts

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University

after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. Special Students not Candidates for a Degree

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed en-

tire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. Preliminary Candidates

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees, which makes the value of the appointment $300. A Junior Fel-

low may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A Citizen's Fund

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

The Eliza D. Dodge Fund.

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

Purpose and Conditions of Fellowships and Scholarships

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as

indicate a decided preference for some particular department. These should be accompanied also, if practicable, by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must cooperate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics,

physics, chemistry, biology, psychology, pedagogy, and economics.

METHODS

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual read-

ing are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1909-1910.

I

MATHEMATICS

Programme for 1909-1910

INSTRUCTION IN MATHEMATICS

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

Differential Equations, and Calculus of Variations; 5 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables, Elliptic Functions, and Definite Integrals; 5 hours a week, through the year.

Theory of Numbers; 2 hours a week, one half-year.

Modern Synthetic Geometry; 2 hours a week, one half-year.

Algebraic Substitutions and their Application to the Theory of Equations; 2 hours a week, one half-year.

Algebraic Invariants; 2 hours a week, one half-year.

Finite Differences; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these

subjects may be made up by attendance on the corsponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1909-1910, the following courses are offered

BY PROFESSOR STORY

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory Courses:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

ALGEBRAIC INVARIANTS; 2 hours a week, second half-year.

Advanced Courses:

HYPERSPACE; 3 hours a week, first half-year.

NONEUCLIDIAN GEOMETRY; 2 hours a week, second half-year.

BY PROFESSOR TABER

Introductory Courses:

DIFFERENTIAL EQUATIONS AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

Advanced Course:

TRANSFORMATION GROUPS; 2 hours a week, through the year.

SEMINARY, through the year.

By PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

By M. DE PEROTT

Introductory Courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.

ALGEBRAIC SUBSTITUTIONS; 2 hours a week, second half-year.

During the academic years 1889-1909 advanced and special courses have been given in:

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDIAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. Theory of Functions according to Cauchy, Riemann, and Weierstrass, with applications.

13. Weierstrass's Theory of Elliptic Functions.

14. Abelian Functions and Integrals.

15. Numerical Computations.

16. Theory of Quadratic Forms.

17. Analysis Situs, particularly the connectedness of surfaces and map-coloring.

18. Surfaces of the Third and Fourth Orders (analytically treated).

19. Plane Curves of the Third and Fourth Orders (analytically treated).

20. Klein's Icosahedron-Theory.

21. Elliptic Modular Functions.

22. Theta-Functions of Three and Four Variables.

23. Riemann's Theory of Hyperelliptic Integrals.

24. Symbolic Logic.

25. Twisted Curves and Developable Surfaces (torses).

26. Rational and Uniform Transformations of Curves and Surfaces.

27. Theory of Functions of a Real Variable.

28. Definite Integrals and Fourier's Series.

29. Ordinary Differential Equations, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's, and Bessel's functions.

30. Partial Differential Equations, including Laplace's, Bessel's, and Lamé's functions.

31. Finite Differences and Probabilities.

32. Applications of the Infinitesimal Calculus to the Theory of Surfaces.

33. Simultaneous Equations, including Restricted Systems.

34. Theory of Transformation Groups.

35. The Application of Transformation Groups to Differential Equations.

36. Theory of Errors.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.[1] Three years of University work are ordinarily necessary to obtain the degree.

The degree of Master of Arts will be conferred upon students who complete with credit an approved course of one year and present a satisfactory thesis.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The Library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals are the following:

Acta mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American association for the advancement of Science. Proceedings, 1848 to date. Complete.

American journal of mathematics. Baltimore, 1878 to date. Complete.

American Mathematical Society.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

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[1]For requirements see p. 54.

Amsterdam. Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Annali di mathematica, pura ed applicata. Milano, 1889 to date.

Annals of mathematics. 1884 to date. Complete.

Archiv der mathematik und physik. 1901 to date.

Berlin. Königlich-preussische akademie der wissenschaften. Mathematische und naturwissenschaftliche mittheilungen aus den sitzungsberichten. 1882-97. Complete.

Berliner mathematische gesellschaft. Sitzungsberichte. 1902 to date. Complete.

Bibliotheca mathematica. Stockholm, Berlin and Paris, 1884 to date. Complete.

Bologna, Istituto di. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1810.

Memorie. 1850 to date. Complete.

Boston. American academy of arts and sciences. Proceedings, 1870 to date. Complete.

British association for the advancement of science. Report. 1831 to date. Complete.

Brussels. Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémoires des savants étrangers. 1889-90.

Bulletin des sciences, mathématiques et astronomiques. 1870 to date. Complete.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

Colorado, University of. Studies. 1902 to date. Complete.

Deutsche mathematiker-vereinigung. Jahresbericht. Leipzig 1890 to date. Complete.

Edinburgh philosophical journal. 1819-1826.

Edinburgh. Royal Society. Transactions. 1783 to date. Complete.

Fortschritte der mathematik, Jahrbuch über die. Berlin, 1868 to date. Complete.

France, Société mathématique de. Bulletin. Paris, 1873 to date. Complete.

Göttingen. Königliche gesellschaft der wissenschaften. Nachrichten von der k. gesellschaft der wissenschaften und der Georg-Augusts-universität. 1853 to date.

Haarlem. Hollandsche maatschappij der wetenschappen. Archives néerlandaises des sciences exactes et naturelles. 1866 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

Internationale mathematiker-kongress. Verhandlungen. 1897 to date. Complete.

Journal de mathémetiques pures et appliquées. Paris, 1836 to date. Complete.

Journal für die reine und angewandte mathematik. Berlin, 1826 to date. Complete.

Leipzig. Königlich-sächsische gesellschaft der wissenchaften.

Berichte über die verhandlungen der mathematisch-physischen classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physischen classe. 1852 to date. Complete.

Liége. Société royale des sciences. Mémoires. 1843 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

London. Royal society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematische annalen. Leipzig, 1869 to date. Complete.

Messenger of mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Milan. Reale istituto lombardo di scienze e lettere.

Classe di scienze matematiche e naturali. Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

Monatshefte für mathematik u. physik. Wien, 1908.

New York mathematical society. Bulletin. 1891-94. Complete.

Nouvelles annales de mathématiques. Paris, 1842 to date. Complete.

Paris. Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Paris. Annales scientifiques de l'école normale supèrieure. 1864 to date. Complete.

Paris. École polytechnique. Journal. 1794 to date. Complete.

Philosophical magazine. London, Edinburgh and Dublin, 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. London, 1857 to date. Complete.

Revue semestrielle des publications mathématiques, rédigée sous les auspices de la société mathématique d'Amsterdam, 1893 to date. Complete.

Rome. Reale accademia dei lincei. Atti. Rendiconti.

Tokyo. Mathematico-physical society. Proceedings (Tôkyô sûgaku-buturigakkwai kizi) 2d Ser., 1901 to date. Complete.

Vienna. Kaiserliche akademie der wissenschaften. Sitzungsberichte der mathematisch-naturwissenschaftlichen classe. 1848 to date. Complete.

Zeitschrift für mathematik und physik. Leipzig, 1856 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche unterricht. 1903 to date.

The department possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table) and a Thomas Arithmometer.

II

PHYSICS

Professor Webster will deliver the following lectures. In order to meet the convenience of students, and to prevent the necessity of waiting for the logical beginning of the cycle, the regular courses are repeated with a cycle of two years. These embrace the subjects that are indispensable, and the pursuit of them will fit the student to read and study any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a*. Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics, B. G. Teubner, Leipzig.

3b*. The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The classical theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism, London, Macmillan & Co.

4a*. Recent Developments in Electrical Theory, including the Theory of Lorentz.

The application to the theory of Electrons and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics.

5a. Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b*. Geometrical Optics. Properties of Systems of

RAYS, AND THEIR VARIOUS ABERRATIONS. HAMILTON'S CHARACTERISTIC FUNCTION OR EIKONAL. APPLICATIONS TO OPTICAL INSTRUMENTS.

6. THERMODYNAMICS. THERMO- AND ELECTRO-CHEMISTRY.

The establishment of the two laws of Thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. THE KINETIC THEORY OF GASES. THE MAXWELL-BOLTZMANN THEOREM AND THE ELEMENTS OF STATISTICAL MECHANICS.

8*. THE THEORY OF RADIATION AND OF A BLACK BODY.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent application of Thermodynamics.

9*. THE PHENOMENA OF CONDUCTION OF ELECTRICITY IN GASES, AND OF RADIOACTIVITY, AND THEIR BEARING ON THE STRUCTURE OF THE ATOM.

10. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Helmholtz's Equation, Beltrami-Lorentz Equation, Telegrapher's Equation, and their special cases; methods of Cauchy, Green and Riemann; Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11*. THE ELEMENTS OF INTEGRAL EQUATIONS, AND THEIR APPLICATION TO MATHEMATICAL PHYSICS.

12*. SELECTED CHAPTERS IN THE APPLICATION OF THEORETICAL PHYSICS TO COSMICAL PHENOMENA, INCLUDING PROBLEMS IN GEODESY, THE TIDES, METEOROLOGY, SEISMOLOGY, AND TERRESTRIAL MAGNETISM.

13*. LINEAR DIFFERENTIAL EQUATIONS.

The applications of the theory of functions to the linear differential equations (ordinary) which arise in mathematical physics.

14* Orthogonal Surfaces and Curvilinear Coordinates, and their Applications.

The courses for 1909-10 will be 5, 5a, 6, 7, 10. During the past year 1, 2, 3, 4, 5b, 12 have been given.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

The facilities without which no graduate department of research in pure and applied physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals by which the history of progress, past and present, may be studied, and kept up to date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

Among the various lines of investigation now attracting the attention of the physicists the following are preeminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and

the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics has hardly begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radioactivity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and about which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics; so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first

rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to war-

rant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique* may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

Requirements for the Doctor's Degree

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, *to be determined in each particular case by the head of the Physical Department.* This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of orignal work, and forming a contribution of value to pure sciencc. The presentation of the dissertation is a prequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is

[1]Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

contained in Dr. Webster's treatise on *Dynamics* and Riemann-Weber's *Partielle Differentialgleichungen.*

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building, forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

Also on the ground floor is a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moment's notice, even at night. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department

of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is devoted to the Rowland twenty-foot diffraction grating, and has a photographic dark room attached. There has been constructed during the current year a storage-battery of two thousand small cells for researches requiring a constant source of high potential. This battery is conveniently housed next to the grating

room. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switchboard in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physic, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered

in the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. There are few subjects connected with physics which may not be thoroughly studied in this library.

The following works may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Gibbs, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Rumford, Tait, Young, Gauss, Fourier, Laplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Korn, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Wallentin, Watson and Burbury, Webster, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Maclaurin, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchhoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston, Weinstein.

Sound. Rayleigh, Donkin, Barton.

A large number of treatises on mechanics, a set of the Travaux et Mémoires du Comité International de Poids et Mesures, and of the published memoirs of the Physikalisch-technische Reichsanstalt, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.
Annales de Chimie et de Physique.
Bulletin of the Bureau of Standards.
Comptes Rendus.
Eclairage Electrique.
Journal of Physical Chemistry.
Nature.
Philosophical Magazine.
Philosophical Transactions.
Physical Review.
Physikalische Zeitschrift.
Proceedings of the Royal Society.
Science.
Science Abstracts.
Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals also :

American Journal of Science.
Annalen der Physik.
Beiblätter zu den Annalen der Physik.
Electrical World.
Electrician.
Elektrotechnische Zeitschrift.
Fortschritte der Physik.
Jahrbuch der drahtlosen Telegraphie und Telephonie.
Jahrbuch für Elektronik.
Journal de Physique.
Le Radium.
Il Nuovo Cimento.

III

CHEMISTRY

The aim of the Department is to equip students for original work in chemistry. Such equipment, consisting in a clear knowledge of the principles and methods of the science, is believed to be best for the industrial chemist as well as for the collegiate teacher. The teacher of chemistry who is unable to contribute a share to the growth of his science will teach the dead letter of some text-book and can hardly impart to his students a practical knowledge of natural phenomena. And in the opinion of leaders of the great chemical industries in Europe, a young industrial chemist, too, is best equipped, not if he has acquired (necessarily unpractical) information in the chemistry of the manufactures, but if he has obtained clear critical knowledge of the principles of pure chemical science and some experience in grappling with difficulties. The desire for *such* knowledge, and the courage and perseverance necessary in attacking problems are acquired only through research.

The work of the Department will be conducted with these principles in view and will be adjusted to the needs of the students from year to year. Advanced students will be expected to spend most of their time on research work. However, specialized courses on topics of history of chemistry, chemical dynamics, heterogeneous equilibria, organic synthesis, stereochemistry, electro- and thermo-chemistry, applications of thermodynamics to chemistry, etc., will be offered,

and the students will be expected to attend them regularly. Each topic will be approached, not as a chapter in a book but as a problem in nature. It will be introduced by an estimate of its importance and of its bearing on other problems. Then an account will be given, on the historical plan as far as possible, of the extent to which the problem has been solved, of how this was done, and of how much is not yet solved, with suggestions as to practical methods by which solution might be obtained. It is believed that such *form* of study, much more than the "advanced" nature of the subjects studied, is the true characteristic of university work.

To aid students not quite prepared for work of this kind, lecture and laboratory courses will be offered in general inorganic and organic chemistry, organic synthesis and analysis, physical chemistry, etc. The time required for such students to qualify for the degree of Doctor of Philosophy will depend in each case upon the proficiency of the student. Residence for one year is required, and three years will not be too long for most graduates. A working knowledge of analytical geometry and the calculus will be pre-supposed in all the work of the Department.

The research work conducted in the Department will be mainly along the following lines: 1. Experimental and theoretical study of the deviations of fact from the accepted principles of general chemistry; 2. Experimental study of organic substances and reactions from the standpoint of chemical statics and dynamics.

Of course, promising investigations may be taken up, from time to time, along other lines as well.

Instead of more or less insignificant pieces of work being "assigned" to students for their first experience

in research, they will be made, as early as possible, the *collaborators* of their professor in his own investigations. Nothing could more certainly assure constant and intimate contact between professor and student and the student's really receiving the best that the Department can offer: individual guidance.

Requirements for the Doctor's Degree

1. A good reading knowledge of both German and French, which the student ought to acquire as early as possible.

2. A working knowledge of analytical geometry and the calculus.

3. The passing of an examination in the several branches of chemistry, including modern physical chemistry, chemical statics and chemical dynamics, and in one minor subject, to be determined in each case by the head of the Chemical Department.

4. Above all, the presentation of a dissertation which in the opinion of the head of the Department will form *a genuine contribution*, either purely theoretical or experimental, to chemical science.

Courses

The following courses are being given during the current year:

A. *Professor Rosanoff's Courses*

It seemed best to devote the present academic year mainly to studies in organic chemistry, by way of preparing a concrete basis for work in general and physical chemistry, to which next year will be devoted in part. The following courses are, therefore, given:

1. Organic Synthesis (laboratory course). Gattermann's *Praxis* is followed, with frequent deviations, however, calculated to prevent the student from following directions like cook-book receipts and to compel him to use his own inventive power.

2. Organic Stereo-chemistry. Tuesdays at 9 A. M. This subject was chosen because presenting an opportunity for a

thorough study of the carbohydrates, of the constitution of benzene, of ethylene derivatives, etc.

3. The Hydro-aromatic Series, including the monocyclic and polycyclic terpene bodies. Thursdays at 10 A. M. This difficult chapter of recent organic chemistry was chosen, not only because a clear knowledge of it is becoming essential in the equipment of the best chemists, but also because it offers excellent opportunities for readings in the periodical literature of the last fifteen years.

4. Colloquium. This is held once a week, from 8 to 10 P. M., in the University Chemical Lecture-room. The students are expected to report on such classical topics as the discovery of oxygen and the overthrow of the phlogiston theory, Pasteur's discovery of the stereo-isomeric tartaric acids, etc.; or on recent contributions, such as typical Grignard syntheses, the reduction work of Sabatier and Senderens, the pyrogenetic researches of Ipatieff, etc. Principally, however, the colloquium is devoted to reports of typical investigations in hydro-aromatic chemistry. The student learns the essentials of the subject in course 3. Thus prepared, he follows up the practical details in the original literature, gradually familiarizes himself with the writings of Baeyer, Wallach, Wagner, Bredt, and others, and becomes accustomed to *the investigator's point of view*. Full typewritten abstracts of all reports will be distributed among the members of the Colloquium for permanent keeping.

This year only about one-half of the students' total working time and energy will have been devoted to actual research.

B. *Dr. Merigold's Course*

5. Advanced Quantitative Analysis and Inorganic Preparations. This course is intended to give a more comprehensive view of the subject of quantitative analysis than is obtained from elementary courses. Lectures treat systematically the determination of all the common bases and acids, with critical comparison of various methods. By discussion of the best methods introduced as a result of recent research, as well as of the best of the older methods, an attempt is made to make this feature of especial value. Attention is given to applications of

modern theories, and some of the more complex methods of analysis are studied in the laboratory.

As a part of the laboratory work there is also given practice in the preparation of pure inorganic compounds. The methods used are not merely those commonly found in the text-books, but are based upon the most careful work to be found in the recent literature of inorganic research.

C. *Special Courses*

6. Dr. Hubbard, of the Department of Physics, will give, jointly with Dr. Rosanoff, instruction in the electro-chemical preparative method in organic chemistry.

7. Professor Story is lecturing in the University chemical lecture-room, Mondays at 10 A. M., on Mathematics for Students of Chemistry. The aim of the course is to help the student acquire that mathematical knowledge without which the professional education of a chemist, whether engaged in teaching or in industrial work, is to-day no longer complete.

Facilities

The University chemical laboratories occupy a considerable part of the laboratory building. The storerooms contain an unusually large collection of organic preparations, besides all the ordinary inorganic chemicals. The collection of physico-chemical apparatus, including the latest form of Pulfrich's refractometer, an excellent Schmidt and Haensch polariscope, a fine spectroscope, a Burkhardt calculating machine, sets of fine thermometers, etc., is sufficient for most ordinary purposes. Whatever special apparatus and chemicals are needed in connection with the work of research are ordered at once, every reasonable effort being made to help the student obtain a maximum of results with a minimum expenditure of time and energy. In this connection it may be mentioned that the Department is at liberty to use the services of the skilled mechanician regularly employed by the Department of Physics. Students will themselves prepare their chemicals, or build their research apparatus only in those cases in which the Director may consider such work especially instructive to them.

It is believed that the facilities for serious research offered by the Department are in many ways exceptional.

The Library

The library of the Department contains complete files of all the more important chemical journals in English, German, and French. The collection of general works, monographs, and reference books is being rapidly enlarged. The productive endowment of the library is very large, and *all* books needed are purchased at once.

Scholarships and Fellowships

The Department has at its disposal several Scholarships and Fellowships, which will be awarded each year to the ablest and best recommended applicants. Scholars, and especially Fellows, must co-operate with the Director in maintaining a harmonious and scientific atmosphere in the Department and in promoting all the ends of the University. They will have no duties besides that of making the best use of the facilities for study and research offered to them.

IV

BIOLOGY

Programme for Year 1909–1910

Dr. Hodge will offer the following courses:

I. Dynamic Biology and General Physiology. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. The first half-year is devoted to the study of a typical series of animals as forces in nature, special attention being directed to methods and apparatus by which dynamics of species may be investigated. On the side of biological theory, which occupies the last half of the year, among others the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classifications of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. Biological Education. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures during October and November.

III. A biological seminary will be held one evening weekly, throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year,

history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1909-1910 will be the first year of the cycle.

Neurology

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows:

IV. Comparative Study of Nervous Systems and Sense Organs. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the different degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. The Human Nervous System and Sense Organs. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.[1]

[1] For elementary courses in special physiology, histology and hygiene refer to announcement of biological courses in the Collegiate Department.

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows:

VI. Practical Histology. The course will be a laboratory course, with such lectures, directions and conferences as may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

II. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

Experimental Work

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most approved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attain-

ments. A course in biology such as is given in our best colleges and State universities is sufficient to enable students to begin work here.

A long-felt need of the department is now supplied in the possession of land well adapted and conveniently located for biological research. Ideal facilities can now be offered for the study of daily rhythms, lives and work of species under natural conditions; and also for experiments in animal and plant breeding. It is proposed to organize an extended series of researches upon the effects of different chemical substances and conditions of life upon the viability and vigor of the germ plasm.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these is to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work

of referring to the literature of topics under investigation in the laboratory.

The Journal Club meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V

ANTHROPOLOGY

Dr. Chamberlain will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. General Anthropology, embracing: (a) History; scope and relations of the science. (b) Physical Anthropology; problems, investigations, results, laboratory work. (c) Ethnography; races and race-origins. (d) Ethnology, Including Sociology; origin and development of the arts and sciences, institutions, ideas and ideals of man and the races of man, human civilizations, their origin and development. (e) Mythology; folk-lore, religions. (f) Linguistics; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (g) Criminal and Pathological Anthropology; physical and mental, ethnic morals. (h) Historical and Archæological; primitive man and primitive culture, the precursors of man.

B. Special Courses upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly The Characteristics of the Primitive Races and their Rôle in Human History; The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples;

the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions; the Development of Human Personality; the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their Relations to Human Evolution; the Negro in Africa and in America; thc American Indian; the Anthropology of Japan and China; "World Languages" and "World Culture".

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI

PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

1. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system and sense organs; the elementary sense experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction times; feelings and emotions; memory; association; attention; apperception; will; fatigue and rest; sleep; hypnotism; temperament; character; interdependencies of mind and body. For this a special laboratory is equipped. See Dr. Sanford's announcements.

III. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Review of experimental and observational studies upon typical forms of animal life beginning with the protozoa. Instincts; animal and human infancy. Childhood and adolescence. See announcements or Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e.g.*, border-line phenomena as seen in neurotic people, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles lectures and clinic.

V. Anthropological Psychology; myths, customs and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

IX. The Psychology of Sex; lessons from the aberrations of this instinct; some of its normal phenomena; the current theories; psychic differences between men and women; education of girls; fatherhood, motherhood; instruction of the young in matters pertaining to sex; theories of Freud, Moll, Ellis, etc.

X. The Psychology of Border-line Phenomena, including spiritism, telepathy, hypnotism, dreams, multiple personality, somnambulism, crystal gazing, dousing, mind reading, sleight of hand performances, major symptoms of hysteria, psychotherapeutics and mind cure, methods of psychological analysis, etc.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

The Psychological Laboratory consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Departmental Library; 2, Lecture Room; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 3, 6, 7, and 8, Rooms for demonstration and research; 9, Quiet room for sound experiments; 10, Photographic Dark Room; 11, Shop. In space and favorable situation the Laboratory leaves little to be desired.

It is also well supplied with apparatus for both demonstration and research, and has access besides to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for particular researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

Provision for Comparative Psychology is now made at the Hadwen Arboretum, about fifteen minutes walk from the main building of the University, where special facilities for the care of the animals have been provided.

The Psychological section of the General Library is full on Experimental and Physiological Psychology, and upon The Psychology of Religion and the Study of Children. All the more important journals upon Psychology and related topics in English, French, German and Italian are received regularly at the University and complete sets of these and of the proceeding of learned societies are upon the shelves of the library.

The following courses are announced for the academic year 1909-1910.

Dr. Hall's Courses

Dr. Hall will probably give the following courses next year, although variations from this programme may be made if there is reason to believe that the greatest good of the greatest number of students will be thereby promoted:

I. The History of Modern Philosophy, beginning with the

Patristic Period, following the evolution of philosophy under the influence of the Church; scholasticism; the philosophy of France, England and Germany to contemporary times.

II. Abnormal and Border-line Psychology; hysteria, epilepsy, psychasthenic states, imperative ideas, anæsthesia, functional paralysis, contractures, convulsions, stigmatas, depression, exaltations, delusions and hallucinations, popular pyschic epidemics, witchcraft, hypnotism, suggestion, confusion, dreams, multiple personality, dementia præcox, aphasia, genius, idiocy, subnormal states, spiritualism, telepathy, psychotherapeutics.

III. The Psychology of Sex, including that of fatherhood, motherhood, marriage, sexual errors and disease, sexual morality, divorce, shame and modesty, prostitution, abortion, illegitimacy, fecundity, eugenics and race suicide, periodicity, the psychological differences between the sexes, sex éclaircissements, school instruction in these subjects.

IV. The Psychology of Childhood from Infancy to Adolescence, supplementing Dr. Hall's volumes on the psychology of adolescence.

V. Present vital themes in education.

VI. The seminary at Dr. Hall's house three hours every Monday evening throughout the year; research with individuals on special topics. For these courses ask for special circular.

Dr. Sanford's Courses

The following courses or their equivalents will be given by Dr. Sanford:

1. *Physiological and Experimental Psychology: The More Complex Mental Processes.* Lectures and demonstrations arranged to present in some detail the more important methods and results of the experimental study of the higher mental processes; Ideas of Space and Time, the Emotions, Voluntary Processes, Association, Memory, Apperception, Understanding and Reasoning. The ground covered will be in general that of the second half of Wundt's *Grundzüge der physiologischen Psychologie*, portions of which may be assigned for collateral reading. Much attention, however, will be paid to the work of other psychologists and especially to the recent literature of the topics treated. Two hours a week, throughout the year.

2. *Comparative Psychology: The Doctrine of Evolution and the Mental Life of Animals.* First semester, a Critical Study of the Biological Theories of Evolution, with collateral reading. Second semester, the Evolution of Mind, with especial reference to the mind of animals, as exhibited by such typical forms as Apes and Monkeys, Rodents, Birds, Insects, and the Micro-organisms. Two hours a week, throughout the year.

3. *General Sketch of Psychology.* This course is offered with a view to the needs of those taking Psychology as a minor subject for the Master's degree. Its aim will be to present in brief and concrete outline the main facts and theories of psychological science. One hour a week, throughout the year.

4. *Psychological Journal Club.* Reports and discussions upon topics of interest from the current periodicals. Meetings are held at Dr. Sanford's house Saturday evenings throughout the year.

5. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. This course is given under Dr. Sanford's direction by a qualified assistant and is intended to lead up to the undertaking of a minor problem for original study toward the close of the year. Four to six hours a week, throughout the year.

6. *Research.* Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr. Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

Psychiatry

Dr. Cowles, lecturer on Psychiatry, former head of the McLean Hospital at Waverley, Mass, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital. Dr. Cowles's course for the year 1908-1909 has included the following topics:

1-2. The dependence of psychiatry upon mental and general physiology, the concept of energy fundamental; the reflex arc and integrative action of the nervous system. Relation of inhibition to anabolism, to external function and katabolism.

3. The physiology and pathology of emotion; depression and exaltation figurative expressions in psychology, both being excitations and katabolic; relations of feeling-tone to conditions of ill-being.

4. Psychasthenia and neurasthenia; the minor psychoneuroses—psychological automatism, fixed ideas, hysteria.

5. Mental systems of nervous exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

6, 7, 8. The melancholia-mania group of neuropsychoses (not tending to dementia).

DR. COWLES'S lectures are open without fee:

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is $10.00.

VII

PEDAGOGY

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

I. (a) Child Study. (b) Pedagogical Psychology. (c) Experimental Pedagogy. (d) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organizations of Schools in Different Countries. (b) The Teaching Profession. (c) Motor Education, including manual training, physical education, etc. (d) Moral and Religious Education. (e) Ideals.

The courses in pedagogy for 1909-1910 will be as follows:

Dr. Burnham's Courses

A. Pedagogical Applications of Psychology. Some of the most important chapters in psychology in their education aspects, such as habit, attention, interest, memory. The correlation of physical and psychic processes. Education of the senses. Apperception and association. Defects of memory. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Suggestion as a factor in education. The training of the will. Mental diseases and the faults of school children. Neuroses of development. Psychological contributions to the hygiene of instruction. The point of view is that of genetic psychology and experimental pedagogy. *Once a week, Saturdays, throughout the year.*

B. The Hygiene of the School Child. This course is supplementary to the course on the hygiene of Instruction given in 1908-09. Some of the more important chapters in modern school hygiene will be considered, including such topics as: The conditions that determine growth and development. The conditions of efficient brain activity. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. Hygiene of memory, of attention, and of feeling. The hygienic aspect of some psychological studies. *One hour a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to some phase of the history of education. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week, throughout the year.*

PRESIDENT G. STANLEY HALL'S COURSE

Vital present topics in education. See special circular later.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been

formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of $20.

VIII

ECONOMICS AND SOCIOLOGY

Owing to the death of President Wright just as we go to press, no positive announcements can be made in this topic for the following year. If the department is maintained in the University, the courses will be determined by Mr. Wright's successor, modified by the interests and requirements of students desiring work in this department. Its general scope has hitherto been somewhat as follows:

1. Recent Economic Theory. This course is devoted in the main to the writings of Jevons and Marshall, Clark and Böhm-Bawerk as presenting leading types of modern economic theory. Some attention is also given to the relation between the present trend in economic thought and present economic conditions.

2. Economic Topics, chosen from such subjects as trusts, the tariff, problems of transportation, and industrial democracy.

3. History of Social Theories. In this course are considered in brief outline the social theories of Plato and Aristotle, of later Greece, of early Christianity, of Rome, and of the Middle Ages, emphasis being laid upon the connection between the theory studied and the existing economic and social conditions. The writings of more recent sociologists are studied as representing the development of certain principles of sociological interpretation.

4. Social Topics, selected from immigration, emigration, fecundity of population, eugenics, pauperism, marriage and divorce, suicide, crime, etc.

5. Socialistic and Communistic Theories of the last century, including an historical survey of communistic societies in Europe and America and a critical examination of socialist doctrines.

This course studies not only so-called scientific socialism and the theories of distribution presented thereby, but views socialism also from the standpoint of social and industrial evolution. The practical difficulties of the socialistic state are taken up in detail.

6. Scope and Method of the Social Sciences. While this course gives some attention to deductive methods and to generalization from historical material, the emphasis is laid upon statistical methods of inquiry. Especial attention is given to the basis and application of the normal law of error. In this connection material is drawn from the works of Quetelet, Galton and Pearson.

IX

HISTORY

Dr. Blakeslee will offer the following courses :

1. Contemporary History.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information from the lectures and from extended reading; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

The subjects recently studied have been Russia,—political, social and constitutional development, with emphasis upon the causes and the events of the revolutionary movement; the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment; the history of the American Negro and the present Negro problem; the Government of Dependencies, including such topics as Race Psychology and the problems of the social, economic, and religious education of primitive peoples; and the present situation in the Far East, especially Manchuria, Korea, Japan, China, the Philippines and Hawaii.

Each year one of the following courses also will probably be given:

2. International Law.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite

cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. English History—the Period of the Tudors and the Stuarts.

This course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. The History of the Christian Church.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. United States History. Different subjects for this course may be taken in succeeding years such as: Colonial Possessions of the United States, including a sketch of the history of

the Dutch, Spanish and Portuguese colonies, and a comparison of their problems, successes and failures with those of the United States in the Philippines and Porto Rico; the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. The students will be expected to present reports upon topics assigned by the instructor; these will form the basis for a critical discussion.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE

PRESIDENT G. STANLEY HALL, *Chairman*
PRESIDENT CARROLL D. WRIGHT
PROFESSOR WILLIAM E. STORY, *Secretary*

LIBRARY STAFF

LOUIS N. WILSON, *Librarian*

ASSISTANTS

EDITH M. BAKER, *Senior Assistant*

LUELLA O. BEAMAN
HELEN J. ELLIOT
ELIZABETH A. FELT
ESTHER A. STONE
MARY D. THURSTON

M. EVELYN FITZSIMMONS, *Stenographer*

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 50,000 bound volumes and pamphlets, and the reading-room receives over 500 journals.

The books are grouped as follows:

A Works of General Reference
B Journals
C Mathematics
C D Math.-Physics
D Physics
D E Physical Chemistry
E Chemistry
F Biology, Zoology, Botany, Physiology, Neurology
G Geography
H Pathology
I Psychology
J Philosophy
K Religious Psychology
L Biography
M Anthropology
N Education
O General Science
P History
Q Law
R Political and Social Science
S English
T Modern Languages
U Classics
W Practical Arts
X Library Science
Y Art
Z Manuscripts

Tuesday and Friday mornings each week all books recently added to the library are placed upon a table in the Reference section where they remain for three days. This affords the members of the University and College an opportunity to examine the new books in all departments before they are placed upon the shelves for circulation.

About once a month, during term, by the courtesy of our booksellers, new books are placed for inspection on one of the tables in the Reference section. Any member of the University or College may recommend the

purchase for the library of books thus displayed, and such recommendation will receive prompt attention.

All books are classified by the heads of departments and particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 380 volumes were borrowed from, and 204 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and begun in October, 1903, are as follows:

VOL. 1

No. 1. Wilson, Louis N.
Bibliography of the Published Writings of President G. Stanley Hall. Oct. 1903

No. 2. Wilson, Louis N.
Bibliography of Child Study for the Year 1902. Jan. 1904

No. 3. Proceedings and Addresses at the Public Opening of the Library Building of Clark University, Thursday, January 14, 1904. Apr. 1904

No. 4. Wilson, Louis N.
Bibliography of Child Study for the Year 1903. July 1904

No. 5. Wilson, Louis N.
Preparing Manuscript for the Press. Jan. 1905

No. 6. Founder's Day, Clark University. Apr. 1905

No. 7. Wilson, Louis N.
Bibliography of Child Study for the Year 1904. July 1905

No. 8. de Perott, Joseph
The Probable Source of the Plot of Shakespeare's Tempest. Oct. 1905

No. 9. Proceedings and Addresses at the Public Opening of the Art Department of Clark University. Dec. 1905

VOL. 2

No. 1. List of Books and Pictures in the Clark Memorial Collection. pp. 74+6 July 1906

No. 2. Wilson, Louis N.
Bibliography of Child Study for the Year 1905. pp. 24. Oct. 1906

No. 3. Wilson, Louis N.
A few titles in Child Study. pp. 8. Apr. 1907

No. 4. Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D. C., Alumni Association, 1907. pp. 39. June 1907

No. 5. Wilson, Louis N.
Bibliography of Child Study for the Year 1906. pp. 26. Aug. 1907

No. 6. Wilson, Louis N.
Bibliography of Child Study for the Year 1907. pp. 30. Sept. 1909

The department of religious psychology, established within the past few years has grown rapidly and

supports *The American Journal of Religious Psychology and Education*, of which the third volume is now nearing completion.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M. each week day from Sept. 1 to July 1. During July and August it is open from 8 A. M. to 5 P. M. from Mondays to Fridays, and on Saturdays from 8 A. M. to 12 M. The library is closed July 4th, Thanksgiving Day and Christmas Day.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and 165,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 10,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out,

but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write nor make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

> "the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income

of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark; those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1. A Curator and Custodian of them have been appointed by the Board (see page 100) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days in term time should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or Fellow shall enter upon other engagements outside

his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at

the October meeting, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 18, 1908, the University conferred degrees upon the following persons:

MASTER OF ARTS

EDWARD MARTIN ARNOS

Thesis: Should inequalities of wealth be regulated by a progressive income tax?

WILLIAM JAMES BEESON

Thesis: The child and his religious life.

FLOYD EARLE CHIDESTER

Thesis: The biology of the crawfish. Extract printed in The American Naturalist, November, 1908, Vol. 42, pp. 710-716.

ELNORA WHITMAN CURTIS

Thesis: The dramatic instinct in education. Pedagogical Seminary, September, 1908, Vol. 15, pp. 299-346.

ROLLAND RAWSON GREENWOOD

Thesis: Henrik Ibsen: His work and significance.

EUCLID HELIE

Thesis: The religious and moral aspects of stoicism.

OLAF KRISTOFER LIE

Thesis: On the reduction to their canonical forms of the equations of transformation groups with continuous parameters.

FRANCIS PATRICK MCNAMARA

Thesis: Marriage and divorce.

WILLIAM JOHN MONTGOMERY

Thesis: On the smallest number of inflexions on a non-singular odd branch of an algebraic plane curve.

Thesis: Solution of differential equations of the second order by means of Lie's theory.

THOMAS LANSING PORTER
Thesis: A study of the forced vibrations of a soap-film membrane.

JAMES ANDREW RUSSELL
Thesis: The religious crisis in France: Its history, causes and results.

EDWARD PORTER ST. JOHN
Thesis: A genetic study of veracity. Pedagogical Seminary, June, 1908, Vol. 15, pp. 246-270.

WILLIAM GREGORY SIDDELL
Thesis: The juvenile court: Its development, work and possibilities.

GEORGE HENRY STEEVES
Thesis: Child labor.

EDITH MAYNARD WALLACE
Thesis: A comparative study of nerves and nerve-endings by the Sihler method.

DOCTOR OF PHILOSOPHY

ERNEST WILLIAM COFFIN
Dissertation: On the education of backward races. Pedagogical Seminary, March, 1908, Vol. 15, pp. 1-62.

HERBERT BURNHAM DAVIS
Dissertation: The raccoon: A study in animal intelligence. American Journal of Psychology, October, 1907, Vol. 18, pp. 447-489.

CHARLES WILSON EASLEY
Dissertation: Partial vapor tensions of binary mixtures.

WILLIS LLOYD GARD
Dissertation: Some neurological and psychological aspects of shock. Pedagogical Seminary, December, 1908, Vol. 15, pp. 439-473.

JAMES WILLIAM HARRIS
Dissertation: The development of the æsthetic interest in children.

Newton Miller
Dissertation: The biology of the American toad.

George Ordahl
Dissertation: Rivalry: Its genetic development and pedagogy. Pedagogical Seminary, December, 1908, Vol. 15, pp. 492-549.

Caroline Amelia Osborne
Dissertation: The sleep of infancy as related to physical and mental growth.

William Lewis Prager
Dissertation: Steric hindrances in esterification.

Hermon Lester Slobin
Dissertation: On plane quintic curves.

Jesse Hayes White
Dissertation: Relations of the racial and individual social instinct.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements.

Eugene W. Bohannon
A. Caswell Ellis

PUBLICATIONS RELATING TO THE UNIVERSITY

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Ramon y Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

The American Journal of Psychology. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume

contains four numbers — issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The Pedagogical Seminary. This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers — issued in March, June, September and December. Price $5 per volume; single numbers; $1.50. Florence Chandler, Publisher, Worcester, Mass.

The American Journal of Religious Psychology and Education. This journal was begun in May, 1904, and three numbers constitute a volume. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and publishes original articles. Each number contains about 100 pages. Price, $3.50 per volume, $1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

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